1875 Vol. XLVI NOVEMBER 30th, 1944

FLIGHT

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AIRCRAFT ENGINEER

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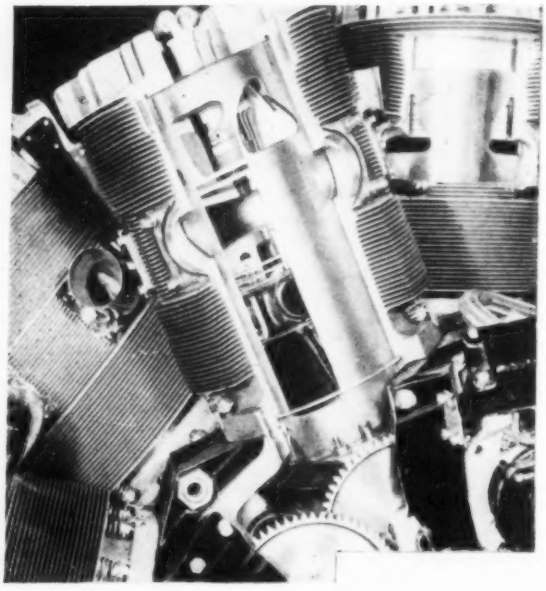

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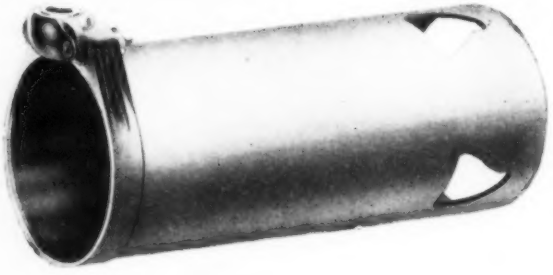
This is one of a series of twelve advertisements prepared for retention, and constitutes a simple story of sleeve-valve advantages. Previous copies are available on request to the Bristol Aeroplane Company Ltd., Bristol.



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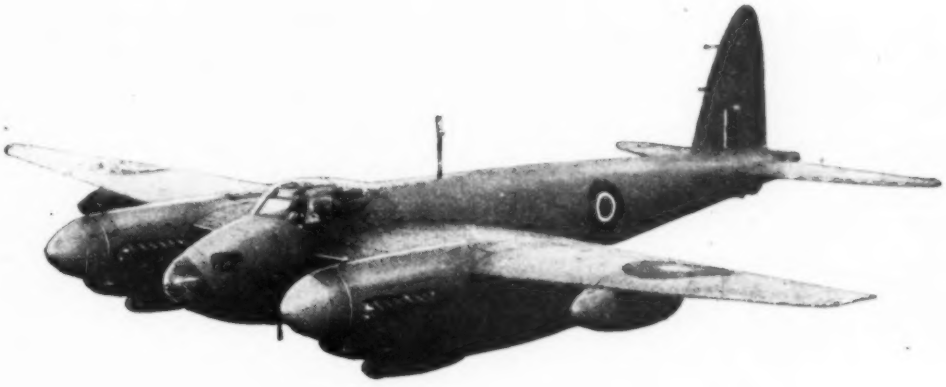

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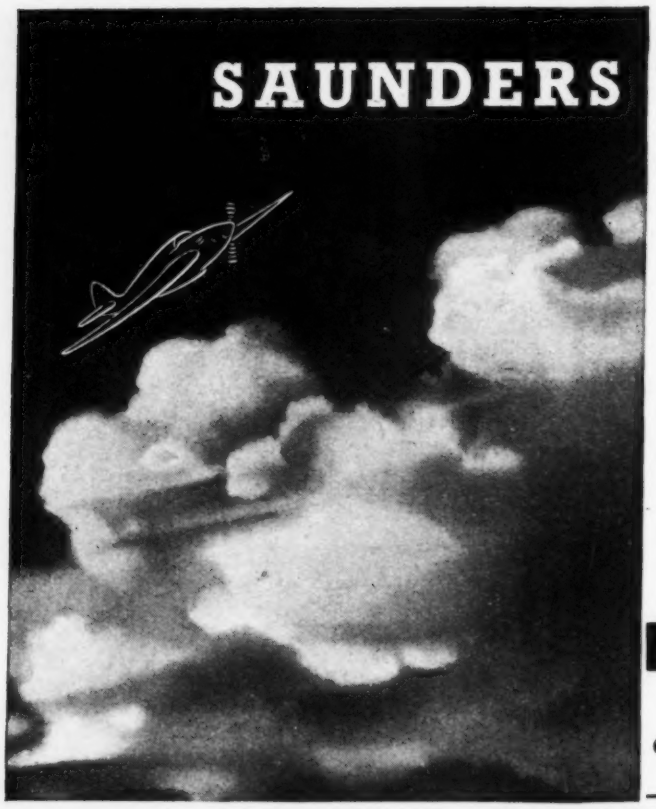

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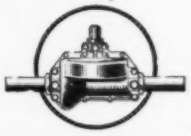

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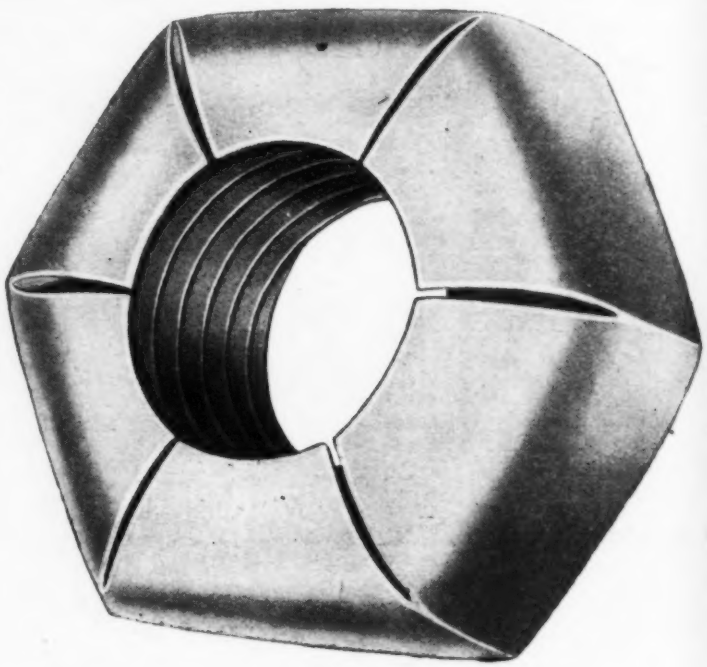

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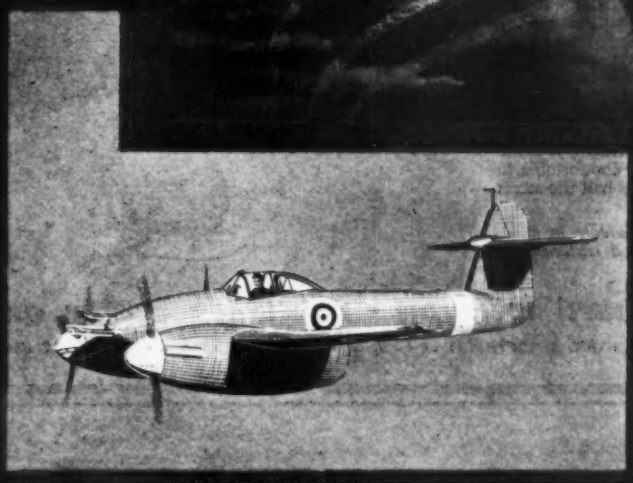

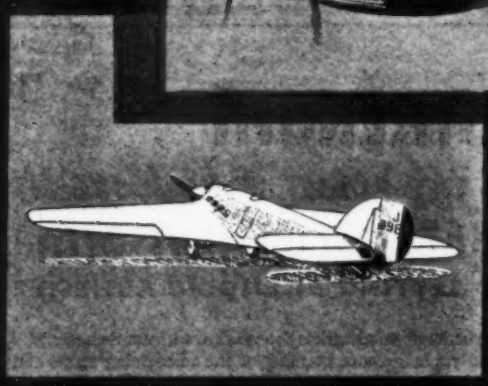

In 1922 Westland made a transport monoplane foreshadowing the evolution of the next two decades, laying the basis of technique which produced the Whirlwind fighter bomber of today, and paving the way for developments of the future.

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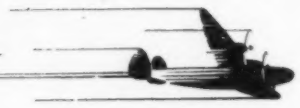

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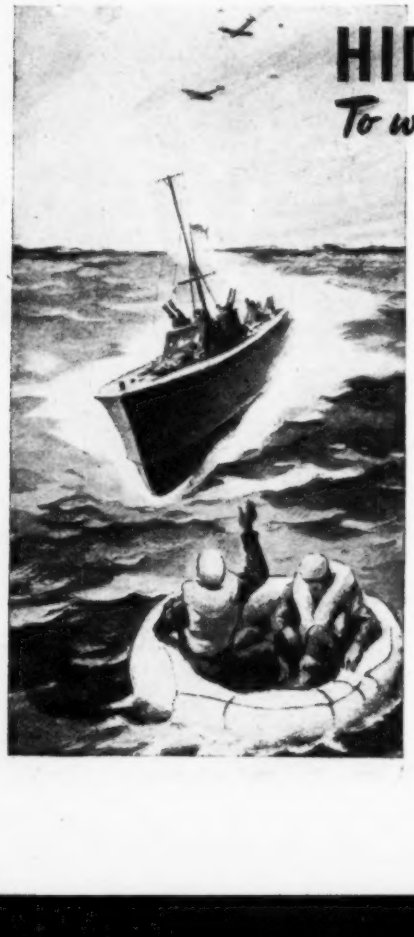

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FIRST AERONAUTICAL WEEKLY IN THE WORLD : FOUNDED 1909

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The Outlook

New Under-Secretary for Air

FOR the first time on record the Parliamentary Under-Secretary for Air is to be one connected with the Fleet Air Arm. Cdr. R. A. Brabner, D.S.O., R.N.V.R., has spent most of the war as a fighter pilot in that brave Service. He was made a Companion of the Distinguished Service Order for gallantry during the escorting of a convoy to Malta, when he was serving in H.M.S. *Illustrious*. He has also served in H.M. carriers *Eagle*, *Victorious* and *Indomitable*. This is a record which proves him to be a determined fighting man.

Without doubt he will bring to the Air Ministry a full knowledge of the Fleet Air Arm and what it needs. In view of the imminence of a total effort by the Allies against Japan this experience should be of great importance, even though it is only in time of peace that the Air Ministry is responsible for providing the aircraft required by the Fleet Air Arm. In time of war the Admiralty places its orders direct with the Ministry of Aircraft Production. None the less, as the Pacific war develops, and carriers play an increasingly important part in it, the Air Ministry cannot but benefit by having as its Under-Secretary an officer who is *au fait* with carrier operations and carrier needs. The appointment of Cdr. Brabner should also promote the already very close co-operation between the Admiralty and the Air Ministry in this war.

A tribute is due to the retiring Under-Secretary, Captain H. Balfour, M.C., who was a fighter pilot in the last war, in the R.F.C. and R.A.F. He is an enthusiast for flying clubs, and he gained the respect of R.A.F. pilots by flying Spitfires and other new types of fighter after he had become Under-Secretary. Whether he held any views as to what British policy in commercial flying after the war ought to be remains unknown. Policy of that sort ought to emanate from the Air Minister; and as Sir Archibald Sinclair has not enunciated any, his Under-Secretary cannot be heavily blamed for keeping his own counsel. He rises in rank by becoming Minister Resident in West Africa—a post held until lately by an ex-Air Minister, Lord Swinton. It is a part of the world which is growing in importance on the air map, and there is a chance there for Captain Balfour to do good work for his country.

Performance and Purpose

IN his article "Arctic Patrol" our war correspondent draws attention to the inconvenient layout of the Consolidated Liberator. This is especially stressed in view of the long-range work on which it is employed. No one must think this is carping criticism of a very fine aircraft, nor that we are looking a Lease-Lend gift horse in the mouth. The point is, however, illustrative of a definite difference in outlook on the part of American designers as compared with our own.

The Americans first build an aircraft—usually a very good one—and then turn it into a fighting machine. British designers, on the other hand, build the best aircraft they can around a set of military requirements. The Douglas Boston, for instance, was, for its time, a grand conception of a twin-engined high-performance aircraft, yet it had a serious drawback. If one of the crew were wounded, none of the others could get to him to render first aid. A design fault such as this can have a far-reaching effect on the morale of air crews. That splendid light bomber the N.A. Mitchell suffers almost as badly in this respect.

In the Liberator it is impossible for a big man, even lying full length, to get past the retracted front wheel if he is wearing a flotation jacket. Parachute harness

has to be discarded. Flying Fortresses, which originally were just long-range aircraft and nothing more, came into service with no self-sealing tanks, no armour plate and practically nothing in the way of defensive armament. Now, with all these things fitted, there is only about half the bomb load available as compared with that carried by our four-engined bombers of about the same horse-power.

The mind that laid out the sleek lines of the Lockheed Lightning could never have taken into consideration what might happen to any unfortunate pilot who had to bale out in a dog-fight.

Our designers and manufacturers chafe under what appears to be never-ending Air Ministry interference. Endless mock-up conferences are held to decide where all the equipment shall be placed, and how the crew shall have sufficient comfort to enable them to do their job efficiently. This may hold up a prototype for a while; it may even detract a little from ultimate performance, but the result is always a good, robust fighting aircraft.

The Civil Air War

MESSRS. SYMINGTON and LaGuardia may or may not be students of Freud. But at Chicago they stopped the conference from shelving the more unpleasant problems and from resting content with what had already been achieved in the way of agreement. There had been a tendency to lay a little too much stress on that which had been agreed, although it was quite a good deal, and too little on the very thorny problems still awaiting solution. "The world expects more from us than that," was how Mr. Symington put it, and this slightly Nelsonian phrase may well become historic.

Canada's suggestion of an "escalator" figure of 60 per cent. of capacity was sound in itself, until it was pointed out that this might, under the "fifth freedom" clause championed by the United States, lead to unfair competition with countries traversed by great trunk lines, which obviously have a right to a full share in their own internal traffic. To us it seems, however, that the two things, Canada's "escalator" scheme and the right to pick up and set down traffic at intermediate points, are not irreconcilable. If traffic figures and profit accounts are disclosed to the international authority, as they would presumably have to be in any case, it should be possible, after the three years' "breathing spell" proposed by Lord Swinton, to see whether a trunk line operated by one of the large nations was taking an unduly large proportion of a traversed country's internal traffic. If that were proved to be so, the additional aircraft capacity granted the large nation under the 60 per cent. clause could be withdrawn.

The Chicago conference must not be allowed to fail on any major point. The eyes of the world are upon it, and it is regarded as a sort of test case of the degree to which, after the war, nations of the world will show good sense in coming to a workable compromise in their mutual relations.

In the meantime, there are straws which show the way the wind of competition is likely to blow. British Latin-American Air Lines, formed by five shipping companies, forecast a daily service to South America when air traffic had developed. British Overseas Airways Corporation retaliated by announcing its readiness to start a South Atlantic air service as soon as Government permission was given. B.L.A.A.L. retorted that it regarded the South Atlantic as the time-honoured field of the shipping companies, to which General Critchley is reported to have said, "Well, perhaps they have had it too long," or words to that effect.

Then there is the question of which shall represent operators after the war, the pre-war but temporarily dormant International Air Traffic Association resurrected, or the newly formed Conference of International Air Traffic Operators. The former has been asked to send representatives to the United States.

Altogether, there are several minor civil air wars brewing.

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IN AT THE KILL: A Mustang bears in on a jet-propelled Messerschmitt 262 fighter before destroying it. The action was recorded while bombers of the U.S. 8th A.A.F. were attacking oil targets in Germany.

WAR in the AIR

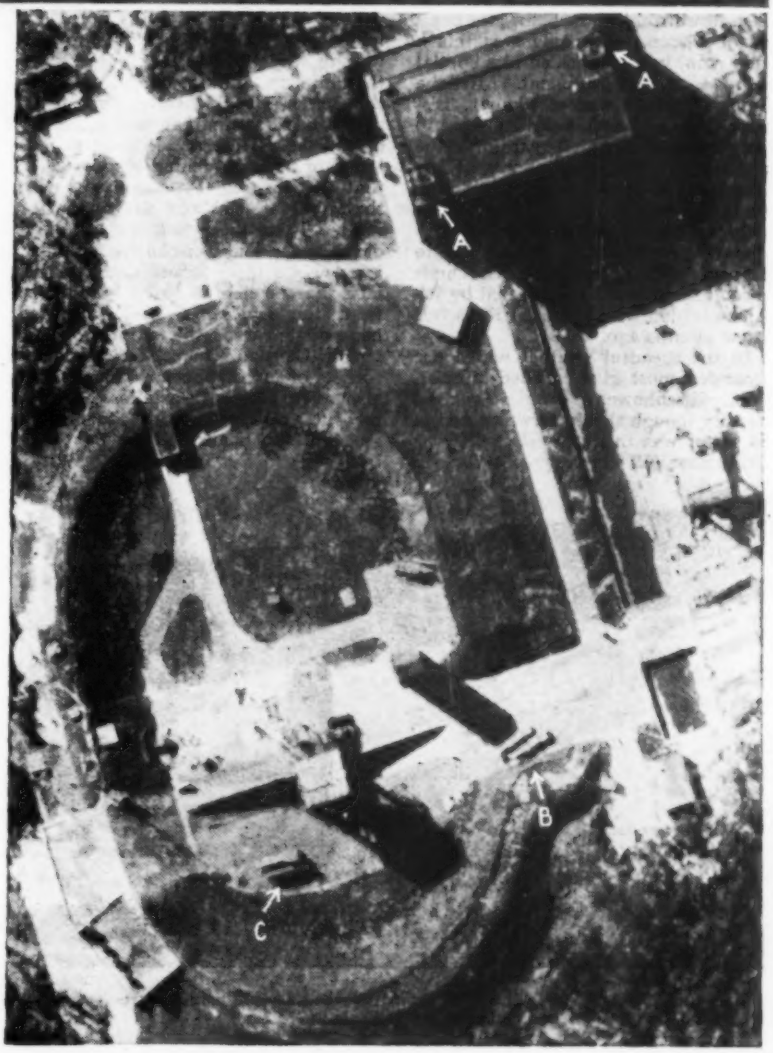
Weather Grounds Allied Aircraft : Success of French Armies : Problems of the War in China

A Tempest tucks its legs up after taking off.

AFTER the two fine days recorded in our last issue, rain descended once more on the battle front in the West, and air operations became the exception rather than the rule in the early part of last week. One reads that on one day the American 19th Tactical Air Force flew more than 100 sorties in support of the ground forces, but the aircrews were unable to observe the effect of their attacks. Bomber Command defied the weather, and continued night attacks on synthetic oil plants in the Ruhr, as well as laying mines where they were likely to do most damage.

Despite the practical absence of air support, the Allied armies continued to press on steadily against strong resistance. During this period the greatest success was gained in the south, where the French Army under General de Lattre de Tassigny broke through past Belfort into Alsace. That Army, together with the American 7th Army, has reached a position from which it may be able to roll up the German left flank. That movement might well develop into a major German disaster.

The Germans have been making their most strenuous efforts to defend their right flank in Holland, which is fighting among the waterways to hold back the Army Group under Field Marshal Montgomery. Probably his



HATCHING THE PLOT : The V.2 rocket experimental area at Peenemünde, on the Baltic coast. From here the Germans fired their latest contributions to civilisation and waited for the Swedes to say where they fell. A. Flak positions. B. Cradles for transporting rockets. C. Two rockets.

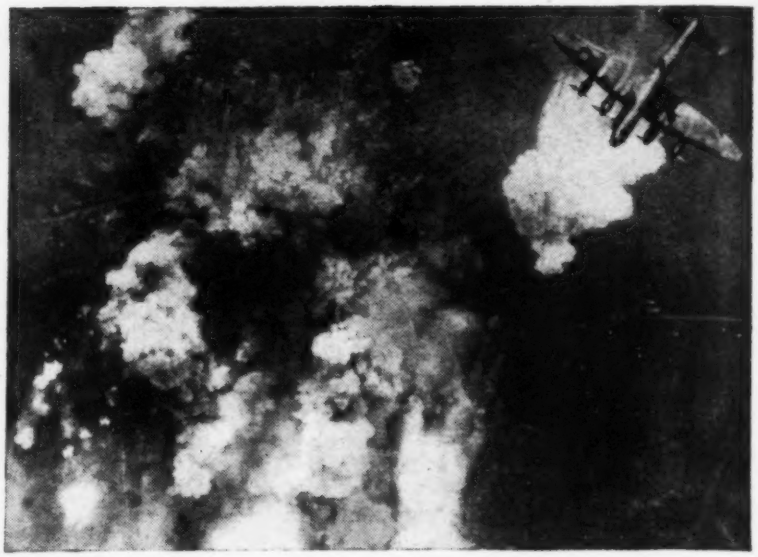
WAR IN THE AIR

name and reputation inspire the enemy with especial awe, and they feel that if he once turned their right flank they would see and experience another of his lightning moves. Sir Bernard is not a soldier with only one plan of campaign. He dashes swiftly whenever the opportunity presents itself; but in the first half of last week he was content to let General Dempsey's 2nd Army slog its way doggedly forward, while the Canadian 1st Army was given a rest after its labours against the coast towns. Dry weather would doubtless speed up the movements of the Allies, and would make the soldiers less uncomfortable, besides restoring to them the help from the air which they value so highly.

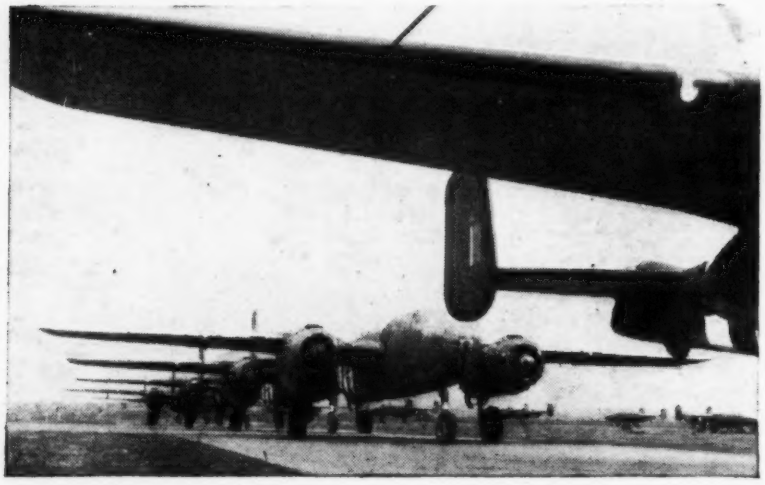
Strasbourg Liberated

ALTHOUGH it received no help from the air, the French 2nd Armoured Division made a splendid dash forward into Strasbourg, the capital of Alsace. Not only was this a solid gain, but it appealed in a special degree to French sentiment. After the Franco-Prussian war of 1870-71, Bismarck annexed Alsace and Lorraine to the German Reich. Thenceforth the symbolical statue of the city in the Place de la Concord in Paris was wrapped in mourning black, until the victory of 1918 restored the two provinces and this city in particular to France. Now it is in French hands once again, and it was liberated by the same division which also set Paris free a few months ago.

In the dreadful weather which has grounded most of the Allied aircraft, Gen. Eisenhower's armies pushed steadily though slowly forward, and in no sector was there any sign that the Germans might win the great defensive battle which they are fighting to the west of the Rhine. The Allies retain the initiative, and never cease to press the Germans back. During one finer spell a broadcasting van pushed ahead of the Allied line and commenced a "war of nerves," telling the Germans that rocket-firing Typhoons were on the way to attack them, and commenting loudly on the attack when it duly developed. The German troops must by now be quite accustomed to the idea that no help is to be looked for from the *Luftwaffe*, and prisoners have dilated upon the extreme dislike which German troops feel for the rockets of the Typhoons. They have also a very strong distaste for the magnificent artillery of both the British and the Americans. They fight on, but they can have no hope of victory. Their leaders doubtless know that even if they wanted to fall back behind the Rhine, they could hardly manage to do so in the face of the relentless pressure of Gen. Eisenhower's men. Above all this, they know that if the weather does clear, the Allied aircraft will waste no time in pouring forth once more and adding to the German difficulties in holding their lines.



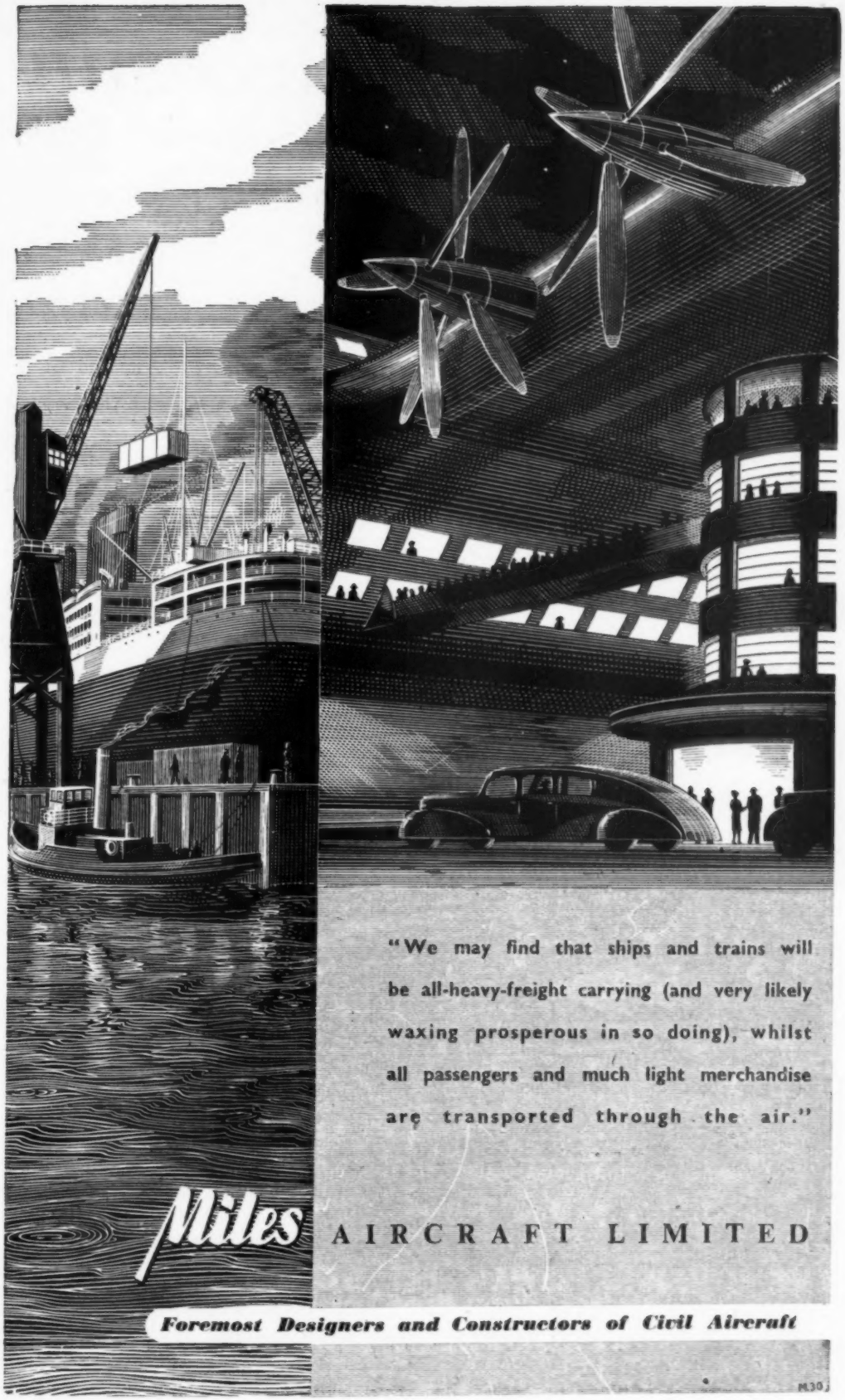
BREWING UP: An R.A.F. Lancaster makes its run over the target during the daylight bombing of Heinsburg.



LINE ASTERN: R.A.F. Mitchells taxying to the take-off point before flying to attack the bridge at Venlo in Holland.

Prospects in China

THE reconstitution of the Chinese Cabinet at Chungking has synchronised with a dangerous Japanese advance in China. Not the least important of the new appointments is that of General Wedemeyer as American representative at Chunking. He has made an important statement of policy, saying that "island hopping" will not by itself suffice to beat Japan. That enemy will have to be defeated on land in China, as well as by sea and air in the Pacific. The first stages of the sea victory have been accomplished, thanks largely to the work of American aircraft carriers. The land campaign is a different proposition. The Japanese advance has deprived the Americans of some important forward airfields. U.S. aircraft from the Philippines are already ranging over the China Sea; but it cannot yet be claimed that the Japanese armies on the mainland have been cut off from their base. Some damage has been done by bombing to factories in Japan, and it is not to be supposed that Japanese industry has the enduring and recuperative power of German war production. There is no doubt that Nippon sees the red light, and the wresting from her of control of the seas must seal the doom of the armies which she has scattered so lavishly over the islands of the East Indies.



"We may find that ships and trains will be all-heavy-freight carrying (and very likely waxing prosperous in so doing), whilst all passengers and much light merchandise are transported through the air."

Miles AIRCRAFT LIMITED

Foremost Designers and Constructors of Civil Aircraft

M.30

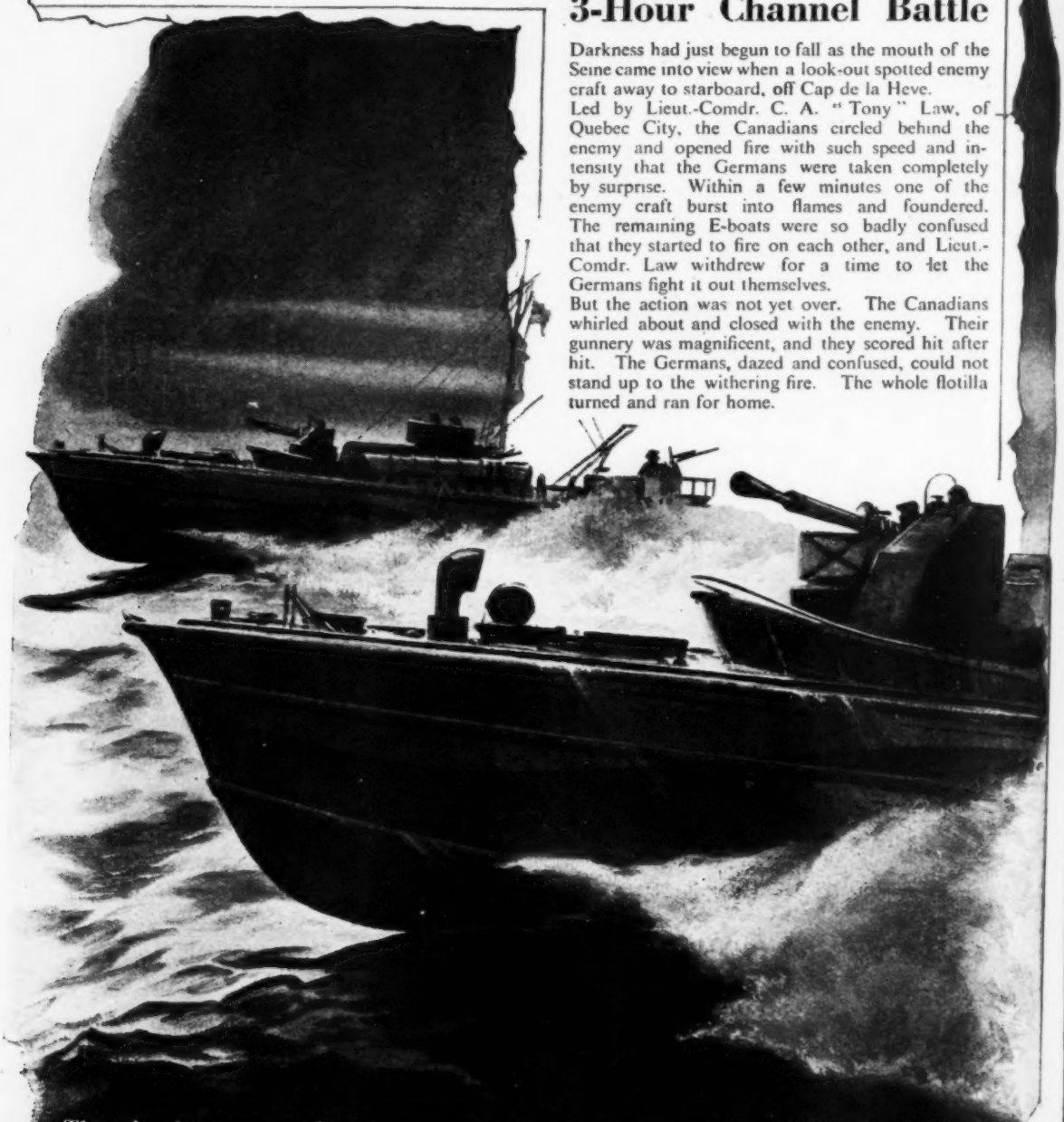
M.T.B.s AVENGE LOST SHIP

3-Hour Channel Battle

Darkness had just begun to fall as the mouth of the Seine came into view when a look-out spotted enemy craft away to starboard, off Cap de la Heve.

Led by Lieut.-Comdr. C. A. "Tony" Law, of Quebec City, the Canadians circled behind the enemy and opened fire with such speed and intensity that the Germans were taken completely by surprise. Within a few minutes one of the enemy craft burst into flames and foundered. The remaining E-boats were so badly confused that they started to fire on each other, and Lieut.-Comdr. Law withdrew for a time to let the Germans fight it out themselves.

But the action was not yet over. The Canadians whirled about and closed with the enemy. Their gunnery was magnificent, and they scored hit after hit. The Germans, dazed and confused, could not stand up to the withering fire. The whole flotilla turned and ran for home.



The development and construction of the modern high-speed motor boat into an efficient fighting vessel is one of the achievements of

THE BRITISH POWER BOAT COMPANY LTD.

Constructors of Scott-Paine designed Surface Craft

WAR IN THE AIR

But to defeat the Japanese armies in China will call for a great effort by land and in the air from the British and Americans.

Tokyo Bombed Again

DESPITE the advance of the Japanese forces in China, the United States gave a prompt demonstration that the homeland of Nippon has not been put in a position where the long arm of American bombers cannot reach it. On November 24th a force of Super-Fortresses set out from Saipan in the Mariana group of islands and flew 1,550 miles to bomb Tokyo. This was the first raid on the Japanese capital by shore-based aircraft. Before setting out the crews were instructed not to damage the Imperial Palace or temples. They duly concentrated their efforts on the industrial quarter of the city, and particularly on aircraft factories.

This raid was made by a new formation, the 21st Bomber Group, based in the Mariana Islands, under the command of Brig.-Gen. Hansell. He has expressed the opinion that the raid did not come up to expectations. It was partly an experimental effort, and he warned people that too much must not be expected too soon from the big bombers; but he was confident that better work would be done in the future. Two bombers failed to return from the raid, but the entire crew of one was picked up near Saipan by an American destroyer. The other was brought down in the sea to the east of Tokyo by a Japanese fighter which crashed into its tail. Whether this was a form of hari-kari by the fighter pilot is not known.

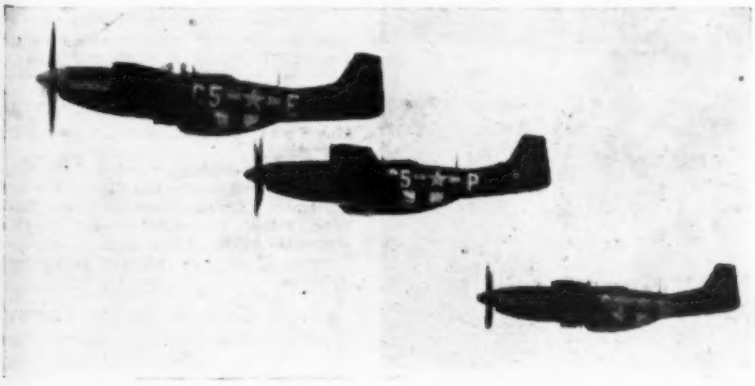
On the Western front there was an improvement in the weather at the week-end, and the 2nd Tactical Air Force, together with American T.A.F.s, duly got busy. Fighter Command scored a gratifying success when a squadron of Australian Spitfires bombed two launching sites for rocket shells. These sites were cleverly hidden in woods, but their concealment and camouflage did not save them. These Australian pilots have been specially trained for the task, and they claim great accuracy for their power-dives with bombs carried beneath the wings of their fighters. After releasing the bombs, the Spitfires raked both positions with cannon shells, hoping to catch the men who work the sites. They, too, are specialists, and it is important to kill as many of them as possible.

The Germans have lately been launching air torpedoes against Allied troops in France. That is yet one more confession of air impotence.

Further examination has now been made of the photographs taken during the bombing of the *Tirpitz*. The conclusion arrived at is that two bombs scored direct hits, and there was one near miss. The hits were scored by the first and fourth bombs dropped. The 14th was the near miss. All these took effect on the port side of the ship. It has been stated that the Germans intend to blow up the wreck so that details of its works may not fall into the hands of the Allies. This looks ominously like making preparations for World War No. 3. But, clever though German scientists may be, we do not think that the British Admiralty needs to go to them for tips.

During the fine spell U.S. heavy bombers were out in strength, and, in addition to the usual attacks on oil refineries, our old friend the marshalling yards at Hamm received a visit. These attacks brought up the German fighters in numbers, and some 200 of them were said to have attacked the raiders. But the American escort of Thunderbolts and Mustangs amounted to 700 machines in all, and they and the bombers between them claim to have shot down 122 enemy machines. That is a very heavy blow for a force which obviously needs to conserve its strength. The much-bombed German factories will have their work cut out to make good such losses.

URGENT AIR TARGETS: The road, rail and canal communications in the Cologne and Ruhr areas.



FIGHTING HORSES: Three of the latest Mustangs off on an escort job over Germany. The increased fin area makes up for the side area lost by fitting the new cockpit.

HERE AND THERE

METEOROLOGICAL OCCASION : Using a bottle of C_2O instead of the traditional champagne, Jacqueline Cochran, chief of the U.S. "Wasps," christens the 10,000th Thunderbolt "10 Grand" with a thoroughly apt cloud.

Visit to T.A.F.

MARSHAL of the R.A.F., Sir Charles Portal, Chief of Air Staff, last week paid a visit to units of the 2nd T.A.F. on the Western Front.

Handing On

MR. J. NELSON, on the completion of 25 years' service with Saunders-Roe, Ltd., has resigned the secretaryship. The vacancy has been filled by the commercial manager, Mr. P. D. Irons, who now combines both duties.

Airgraphs from India

DURING the 1943 fiscal year more than 20,000,000 Airgraphs were sent from India to the United Kingdom, the Dominions and other countries, it was reported last week.

Trade Appointment

MR. W. R. GROVES, until recently hydraulic engineer at the Turner Manufacturing Co., Ltd., Wolverhampton, has been appointed chief designer of that company. Mr. Groves has extensive experience in hydraulics, particularly as applied to aircraft.

Anonymous Generosity

WITH a recent cheque for £1,000, a woman in Natal has now brought her anonymous donations to the Natal Spitfire Squadron of the 2nd T.A.F. up to the grand total of £10,000.

The cheque was sent to the Secretary for Air.

Capt. Balfour's Successor

Cdr. R. A. Brabner.

CDR. R. A. BRABNER, D.S.O., R.N.V.R., has been appointed Parliamentary Secretary for Air in succession to Capt. Harold Balfour.

During the present war, Cdr. Brabner has seen considerable active service as a fighter pilot in the Fleet Air Arm and served on H.M. carriers *Illustrious*, *Eagle*, *Victorious* and *Indomitable*.

He is the first officer of the Fleet Air Arm to hold his new appointment.

Capt. Balfour, who was a fighter pilot in the R.F.C. and R.A.F. during the last war, is to be Resident Minister in West Africa in place of Lord Swinton, now Minister of Civil Aviation.

Air League Announcement

THE Executive Committee of the Air League of the British Empire decided to abolish the office of an executive controller as from November 23rd, 1944.

Well Armed

THE Martin Marauder III, it was announced last week, now has twelve 0.5in. machine-guns.

This medium bomber, powered by a pair of 2,000 h.p. 18-cylinder Pratt and Whitney "Double Wasp" engines, has a top speed of more than 300 m.p.h.

Spanish Soaring Record

A NEW Spanish record for sailplanes was set up last week by Senor Caros Ara, head of the gliding school at Monflorite, in the Province of Huesca, when he reached a height of 17,939 feet.

The flight lasted 1¼ hours and Ara beat his own record of last year when he soared up to 14,154 feet.

Empire Study

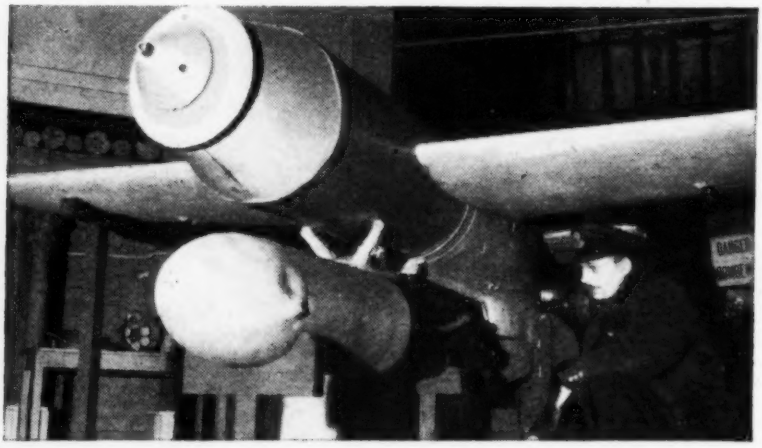
PARTIES of A.T.C. cadets from London and Home Counties squadrons are to pay regular visits to the Imperial Institute, South Kensington, as part of a campaign to make members of the Corps "Empire air conscious." The move has the blessing of the Colonial Office and the Dominions, who are co-operating.

Forty cadets from the Lambeth Wing were chosen to form the first party, and Sir Harry Lindsay, director of the Institute, kindly consented to act as their personal guide. Tea and a show of Empire films were included in the programme.

From Guns to Rocket Tubes

FIRESTONE'S anti-aircraft gun factory has been completely turned over to the manufacture of rocket tubes, it was recently reported.

Now being "turned out by the thousand," they are said to be made "either from magnesium or plastic-hardened



SEA DOODLE : This brand new Hs 293 radio-controlled, rocket-propelled flying bomb (somewhat inaccurately called a glider-bomb), was found packed for transport near Paris where it is now on show. This type of missile has been launched from German aircraft against Allied ships at sea.

HERE AND THERE

paper," and are 10ft. long and 4½in. in diameter.

Lights Up in Finland

FINLAND has now scrapped its black-out everywhere except in Lapland. In central Finland and some other provinces it was lifted early in October.

Who Says We're Soft!

"THERE is no Christmas fare from 'Naafi' for German and Italian prisoners and Italian co-operators," said a recent statement. "It will all go to British and Allied troops."

By Jove, we *are* getting brutal, aren't we!!

More Superforts

THE U.S. War Dept. has placed an order with Boeings for 1,000 B-29 Superfortresses in addition to the recent order for 700 of these bombers.

The cost of the additional order is reported to be $1,145,000,000, or roughly £286,000,000.

Not Just Yet!

MR. O. T. LARSEN, vice-president of T.C.A., recently expressed the opinion in Montreal that it would be three or four years before the $100 air trip across the Atlantic would be possible. ($100 is about £25 at the present rate of exchange.)

Such cheap trips, he said, were "not at present technically feasible."

French Airlines Cover 47,000 Miles

THE French civil airways are now covering routes totalling 47,000 miles, said Paris Radio quoted by Reuter.

Regular services exist between France and most of her Dominions, including Madagascar, the Reunion Islands and North Africa.

Swiss Air Mail Stopped

OWING to the interruption of the mail service beyond Lisbon, the civil air-mail service to Switzerland has again been suspended. Letters for that country may still be posted for transmission by surface route throughout, but transit time cannot be indicated.

Correspondence for prisoners of war is not affected.

Just in Case

WRIGHT FIELD, which is the U.S. equivalent of our Farnborough, stated recently that they have now produced a robot flying bomb which is a development of the German V-1, but better.

"We may never need it," adds the report, "but if we do we've got a good one."

U.S. Aircraft Output

UNITED STATES factories built 232,403 aircraft, including 74,953 bombers and 70,627 fighters, between July 1st, 1940, and September 30th, 1944, the War Production Board announced in a report recently issued.

This is the first time such detailed figures have been disclosed.

R.A.F. VETERAN: A Lancaster bomber, "M for Mike," with 131 sorties to its credit including 15 to Berlin, is "awarded" a bar to the D.F.C. it received after 50 missions. The D.S.O. went up on its nose when it topped the century.

Delivering the Goods

AIRCRAFT of the U.S. Air Transport Command, most of them Douglas C-54 Skymasters, arriving in the United Kingdom since the beginning of the year have totalled 3,000 in round figures.

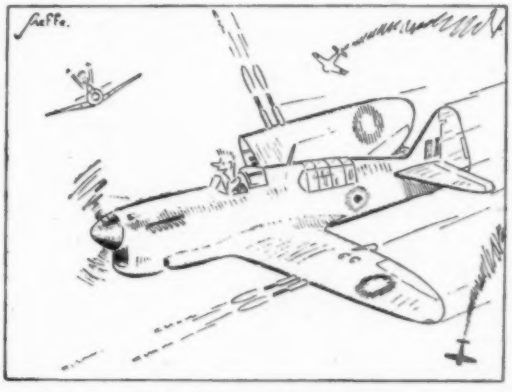
This includes cargo planes from Italy, North Africa, and the U.S., but excludes ferried aircraft.

Two A.T.C. Appointments

GROUP CAPT. C. E. MAUDE has been appointed Deputy Director of the A.T.C. responsible for personnel, training and provisioning, under Air Marshal Sir Leslie Gossage, the Director General. He succeeds Group Capt. J. E. Allen.

Group Capt. Maude was one of the earliest of the R.N.A.S. pilots. He learnt to fly in 1913 at Upavon.

A second post of Deputy Director has now been established for dealing with general policy, administration, and equipment accounting. This post has been filled by Mr. S. W. Warren, who has served for two years in the U.S., where he was attached to the R.A.F. delegation in Washington.



Where there's a will—

"The Christmas Tree"

THIS is the attractive title of a very attractive sale opened at Rootes' Piccadilly showrooms last week in aid of the Soldiers', Sailors' and Airmen's Families Association, and which is to remain open until December 2nd.

Lady Margaret Alexander, wife of Gen. Alexander, performed the opening ceremony, and Air Vice-Marshal Sir Norman McEwen (ret.) presided.

Open from 10 a.m. till 5 p.m. daily, this sale appears to offer almost everything from toys to turkeys, and thus offers a wide range of Christmas gifts plus the satisfaction of helping a good cause.

Aslib Conference, 1944

THE Aslib Conference which had to be postponed in September will now be held on Saturday and Sunday, December 9th and 10th, at the rooms of the Royal Society, London, W.1. The opening address will be given by the President, Sir Frederic Kenyon, G.B.E., K.C.B., on "Organised Knowledge in the World of the Future."

There will be a symposium on "The Empire Contribution to the Flow of World Information" and a discussion on the status and education of special librarians and information officers, together with several shorter papers.

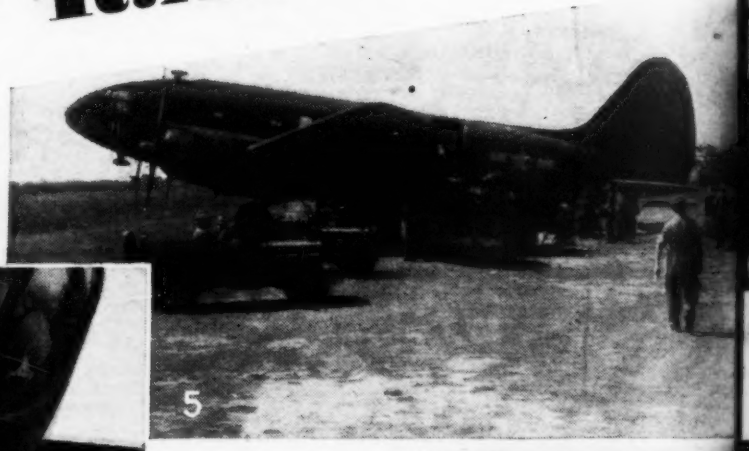
Perhaps we ought to mention that "Aslib" stands for Association of Special Libraries and Information Bureaux and that full particulars can be obtained from their office, 31, Museum Street, London, W.C.1.

R.A.F. in Burma

1 Bullock carts used in airfield construction in Bengal pass in front of a Liberator.

2 Indian workmen constructing a bamboo basket work "basha" screen roof of a blast bay. The bamboo "basha" is the local form of camouflage.

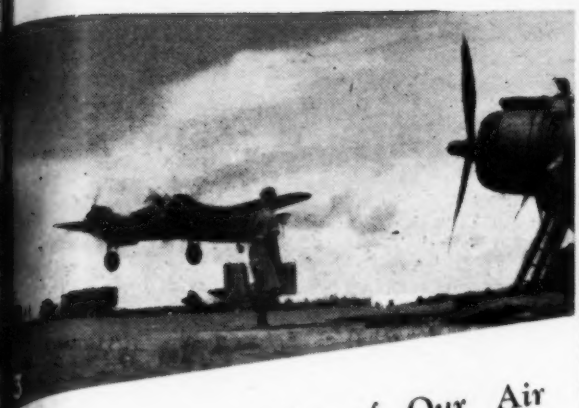
3 Warrant Officer Davison, navigator in a photographic reconnaissance unit, about to get aboard his Mosquito.



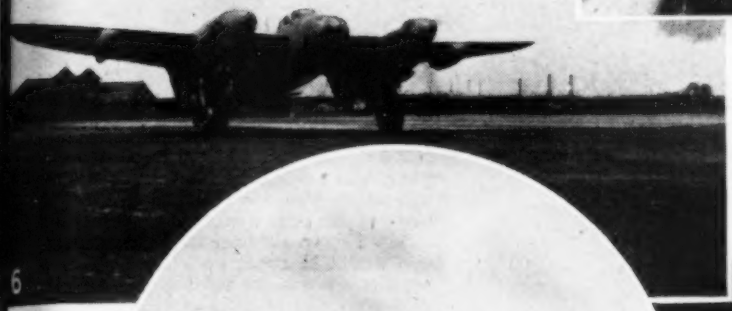
5 Loading jeeps, mules, men and supplies of the 5th Indian Division which was taken in a few hours from Arakan to the Imphal Plain, a distance of 300 miles.

6 A long-range photographic Mosquito taxies out before take-off. The enormous areas to be watched for enemy activity put a great strain on our photographic reconnaissance units.

9 Back from a sortie on the Arakan front, the pilots are being interrogated by Capt. C. M. Wells, an Air Liaison Officer.



Photographs of Our Air War Against the Japanese



3 "Whispering Death." A Bristol Beaufighter coming in to land on a forward airfield after attacking Japanese river traffic.

4 Flying Control gives a "green" from the two storey log and corrugated-iron control tower of an airfield in the Imphal Valley.

7 A trustworthy Ansor delivers the troops newspaper "SEAC." Only once, during a monsoon, has it failed to complete its journey.

10 Scrutinising aerial films as they come from the darkroom. L. to R., Capt. Wells, A.L.O., F/O. K. G. Raman and F/O. J. J. Over, the wing photographic officer.

Horace Says . . .

The Square-cube Law—Modern Version

By W. S. SHACKLETON

THE Editor handed us a cutting from a recent edition of a famous London daily newspaper. It showed a map of most of this country with, superimposed, the silhouette of a giant Liberator. Its wing stretched from the Firth of Tay to the Channel Islands and its fuselage from Lowestoft to the Welsh coast. (Horace our Tame Stressman subsequently estimated the wing span as roughly 2,708,001ft.). Obviously, the gentleman's boudoir on such an aircraft could be as big as an English county. Mr. Rumbold really could spread himself in such circumstances!

The Editor said, would we study the picture and its two captions. We read:

"25,000 *PLANES FLY ATLANTIC*"

and "*In the past four years* 25,000 *planes have been flown to Britain from Canada and the U.S. This diagram shows the area they would cover—supposing their average size to be that of Liberators—compared with England.*"

The Editor said there seemed to be something peculiar about it. If that was the area covered by just those planes which had *flown* the Atlantic, what about all the extra area covered by the planes which had been shipped over? Then there was our own wartime production of 100,000 plus; where were they to be parked? At this point we reminded him also of the 50 or so Flying Fleas which we had when the War broke out. We ventured that if the picture was right, the outlook for agriculture in this country did not seem promising. We said that perhaps there was a mistake such as would occur if the calculations had been done by a statistician or by an Aeronautical Expert.

The Editor said perhaps that was so and would we write up a short article immediately. So we asked what would he pay and he said "The Highest Rates in Journalism." So we took the picture back to our office to show to Horace our Tame Stressman.

. . . a mere 25,000 times too big, said Horace.

25,000 Planes Fly Atlantic
SCOTLAND
GLASGOW
EDINBURGH
NEWCASTLE
ENGLAND
LONDON
BRISTOL
PLYMOUTH
FRANCE
IN the past four years 25,000 planes have been flown to Britain from Canada and the U.S. This diagram shows the area they would cover—supposing their average size to be that of Liberators—compared with England.

Britain First

Now our Horace has what can only be described as *An Engineering Instinct*. Also, he has an uncanny head for figures.

He knows the near-answer even before he takes up his sliderule. Very definitely, he has a first-rate brain. Indeed, his father, an Archbishop and perhaps the greatest classical scholar of his era, once said of him "Horace sure can utilise his loaf." It is a fact that he *never* makes a mistake, because if he does it is merely a slip. That is why we recently increased his salary to £3 10s. per week—although naturally this stipend is gross and before deductions are made for stamps, 9d. for 4d., etc.

When we got to our office, Horace was sitting in *our* chair with his feet on *our* desk. He had a sliderule in one hand, a large and foul-smelling pipe in the other. Evidently the tobacco was *ours* too! A beautiful smoke ring, which Horace said had a circumference of pie D or something, was soaring gracefully towards a nail on the wall. We noticed that two other smoke rings were hanging there.

So we showed Horace the picture and said would he check up as to whether the aircraft was not too big. Horace thereupon discharged a multiplicity of smoke rings which, he said, were perfect examples of endless annular vortices with radial airflow in convective equilibrium. We said, would he please figure out the picture and let us know because the Editor was waiting.

Horace said that he had just read that we were going to spend 0.75 million pounds on a new House of Commons with 80 deg. F. bronze heating plates under the Members' feet, and with a circulation of pseudo spring or woodland air to cool their fevered brows and could he have similar facilities in his Stress office?

And, he said, why rebuild the House of Commons? What was the matter with the Albert Hall, particularly if the Albert Memorial was placed on top of it?

He said it would require a large, central, tubular steel strut from the centre of the roof into the ground, to take the extra weight of the Memorial. He would make certain assumptions and work out the moment of inertia of such a strut; also the distance between points of contra-flexure, length of radius-of-gyration ratio, optimum diameter. . . . We managed to stop him at this point by offering him some more of our tobacco adding, sternly, that his comments on the big Liberator were urgently required.

Horace said that after this War there would be three entirely new Political Parties in the House of Commons—the A's and the two U's. He said that the present three Great Parties would disappear entirely, as would the others. The Conservatives, the Liberals and the Labour Parties would become respectively the Austerities, the Utilities

HORACE SAYS . . .

and the Utopians. There would be one exception, and one exception only, and Horace said *he* would be that Member. He would be a W.P.T.

We said what was that, and he said "A Wensleydale Particular Thoroughbred." (Actually he comes from some place in that direction.)

So we said all this was extremely interesting but it was getting us nowhere. The point was that the Editor wanted a report on the area covered by those 25,000 Liberators and what was the use of buying umbrellas if the whole country was covered with flying machines?

Horace said what time was it, so we said it was nearly time to go home and the job had to be done to-night, whereupon he became very energetic.

He consulted his sliderule and gave us a kindly look and said he must explain this to us in simple language.

He said that if you *doubled* all the dimensions of an aircraft, its wing area would be four times as great and its volume eight times as great. We said that we had followed him as far as that so he tried to take us a step further. He said that if you *trebled* all the dimensions of the machine it would have nine times the wing area and 27 times the volume. It was the square and the cube and did we follow him? We said that we had got in all right up to nine but now he was getting into the higher mathematics. So he said: "Span of Liberator 110 feet, times the square root of 25,000 which is about 158 equals 17,400 feet which divide by 5,280 equals 3.3 miles. The wing span of a Super Super Liberator with an area equal to 25,000 ordinary Liberators is therefore 3.3 miles."

"It would not stretch from the Firth of Tay to the Channel Islands. It would fit easily in some of our London Parks. He then said that the giant Liberator had been drawn a mere 25,000 times too big!"

Of course, mind you, that is only what Horace says. We do not profess to understand things of that kind ourselves.

Horace our Tame Stressman filled his pipe with the last of our tobacco and presently blew a lovely smoke ring or radially rotating vortex at the nail on the wall. He looked at the clock—it was time to go home. A cherubic expression suffused his seraphic countenance as he said "The time is

$$\frac{y}{y-1} \cdot \frac{Po}{Wo}\left\{1-\left(\frac{P}{Po}\right)^{\frac{y-1}{r}}-\int_{y}^{x}\frac{h_1-h_2}{2}\sin\theta\sqrt[3]{\frac{FEW}{MANY}}\right.$$

"In other words, approximately half a dozen o'clock," he added.

More About Burma

Doings of the 3rd T.A.F.

IN our issue of October 12th last we published an article on the part played by air power in the fighting in Burma. More details were given last Wednesday in a Press interview by Air Marshal Sir John Baldwin, K.B.E., C.B., D.S.O., who is now on leave in this country after having commanded the 3rd Tactical Air Force in the South-East Asia Command.

The Air Marshal said that the East Asia Air Command was the nerve centre of the war in Burma, and he could not conceive a movement being undertaken there which was not based on our air supremacy. Explaining the difficulties which pilots had to face there, he pointed out that all the rivers ran from north to south, and the valleys and mountain ranges conformed. The mountains ran up to a height of 9,000ft. The other great difficulty was the weather, which was bad for six months of the year. Even before the break of the monsoons there was always a period of two months of tropical thunderstorms, which were sometimes 250 miles long. These storms were either white, black or brown. If there were need one might take a chance and fly through a white one. One would only venture into a black one if there were urgent need, such as shortage of petrol. To fly into a brown one was just suicide. In two cases he had known the wings to be torn off.

Only during the last two monsoons had the R.A.F. been able to operate, as the latest electrical appliances had now been introduced. Radio beams were what really made it possible. At first both sides gave up flying during the monsoons, and the Japanese still would not operate during those seasons.

Runway Problems

In Burma there were very few places where airfields could be made. In between the monsoons they were able to use dry *padi* fields, but during the rains hard runways were essential. There was no stone in Burma, and it had to be imported from India. The alternative was to make the runways of bricks, burnt locally; but the coal for burning them had to come from Bengal. Another drawback was that the only good repair base was at Calcutta.

An interesting incident mentioned by the Air Marshal concerned the flexibility of our use of the air. At one time the Chindits were embarrassed by having to carry 500 wounded and sick men, and they would be useless as a fighting force unless they could be relieved of them. They were at that time in an area where there was no possibility of making an airfield for large aircraft, but fortunately there was a large lake (which they were able to guard) at a place called Inddayggyi (pronounced Indawji), and it was arranged that two Sunderland flying boats should alight on this lake and carry off the casualties. This was done. At an early stage of the operation a Japanese reconnaissance machine sighted the flying boats; but they were never attacked. This was not due to Japanese "bushido," but to the extraordinary inflexibility of the Japanese mind. They seemed unable, said the Air Marshal, to deal quickly with anything new or unexpected. Flying boats over Burma were something which they had never expected, and they probably referred the matter to their H.Q. at Bangkok. Doubtless the orders came through in due course for fighters to shoot down the Sunderlands but by that time the casualties had all been evacuated.

Japanese Performance

The Air Marshal had a good deal to say about the Jap as a fighting man. In a hole or other defensive position he was good. On the move he was not so good, and he had a distinct dislike to cold steel, whether bayonet or the *kukri* of the Gurkha. In the air he showed the same qualities. His fighter aircraft was a good machine, more manœuvrable than ours, and a better climber, but not so fast as the Spitfire. So long as things happened according to the book he had learnt, the Jap fought well, but a surprise upset him. Sir John said that he had some difficulty in training his Spitfire pilots in the best way to deal with them. That was to break off and climb in good time and then dive on to the enemy. It was no good staying down and "mixing it" with machines which were more manœuvrable and could climb faster. As for the Japanese bombers, it was sufficient to say that he had never known them to carry a bomb of more than 100 lb., and those bombs were not much good in their occasional raids on Calcutta.

Sir John gave high praise to the Indian Air Force. He had four squadrons under him, two commanded by Sikhs, one by a Hindu, and one by a Mussalman. An Indian Observer Corps has also been raised, and its posts did very good work indeed. He also mentioned the Burma Navy, which has recently been raised, using small launches along the coasts and on the rivers, and he said some of the launches had done very gallant work. The captains were mostly European, but he believed some Burmese captains had recently been appointed. He gave very high praise to the Royal Air Force Regiment, and said he would have liked to have had more contingents of it, so as to relieve the ground crews from the task of airfield defence. The men that he had often fought among the soldiers of the Army.

Finally, we must not forget that Sir John mentioned the Mitchell medium bomber and the heavy Liberators which have shared in the work of the Eastern Air Command.

(A set of pictures from Burma will be found on pp. 578-579)

ARCTIC PATROL

SINCE D-Day everyone's eyes have been focused on the war on the Continent. This is not surprising, but the fact must not be lost sight of that there are still thousands of men and women doing dreary jobs in remote places whose work is just as essential to victory. In particular, the ground and aircrews who are stationed at northern airfields and patrol right up into the Arctic Circle have, perhaps, the most thankless and desolate occupation of all. It was with this in mind that I flew north to visit a typical V.L.R. Liberator squadron of "Bluenoses" under the command of Wing Cdr. Fleetwood.

It seemed a longish journey in the Airspeed Oxford, and it would have been somewhat tiresome but for the interesting weather conditions obtaining on that day. A low-pressure area over the Baltic and a warm front coming in from the west caused a strong current of cold air from the Spitzbergen region to pass over the British Isles from north to south. Temperatures were low. At the 1,000ft. at which we were flying it was only one degree above freezing, and the requisite 42 deg. F. of frost necessary to produce exhaust condensation trails were to be found at the relatively low height of 18,000ft. At about this height there was also a thin layer of alto-cumulus cloud.

The conditions were such that an aircraft flying in the clouds left a double lane of clear blue sky with a narrow line of cloud between to mark its passage. Everyone who could make the height went up to add to the fantastic patterns in the sky, and, strangest of all, these lanes persisted for very long periods.

ALL AIRMEN, WHEREVER YE MAY BE,
GREETINGS: KNOW ALL YE BY THESE PRESENTS, THAT
S/L F/L. G.A. POTTER
DID, ON 7th SEPT. '43 APPEAR IN THE NORTHERNMOST REACHES OF MY REALM, ENPLANED IN THE A/C M/120, IN LATITUDE 66°-33N. AND LONGITUDE 26° 32°W, BOUND FOR THE DARK AND FROSTY WASTES OF
THE LAND of the MIDNIGHT SUN
AND DID WITH MY ROYAL PERMISSION, ENTER THIS DREAD REGION BY
CROSSING THE ARCTIC CIRCLE
BY VIRTUE WHEREOF, I, NEPTUNUS REX, RULER OF THE RAGING MAIN DO HEREBY DECLARE HIM TO BE A LOYAL AND TRUSTY Bluenose.
AND DO CALL UPON ALL ICEBERGS, SEALIONS, NARWHALS, POLAR BEARS, WHALES,
AND OTHER CREATURES of the FRIGID NORTH, TO SHOW HIM DUE DEFERENCE AND RESPECT. DISOBEY UNDER PAIN OF MY ROYAL DISPLEASURE!
Aurora Borealis
Neptunus Rex
RULER OF THE RAGING MAIN
BY HIS TRUSTY SERVANT
CERTIFICATE No 641

SELECT BAND: Every aircrew who enters the Arctic Circle by air is entitled to one of these certificates.

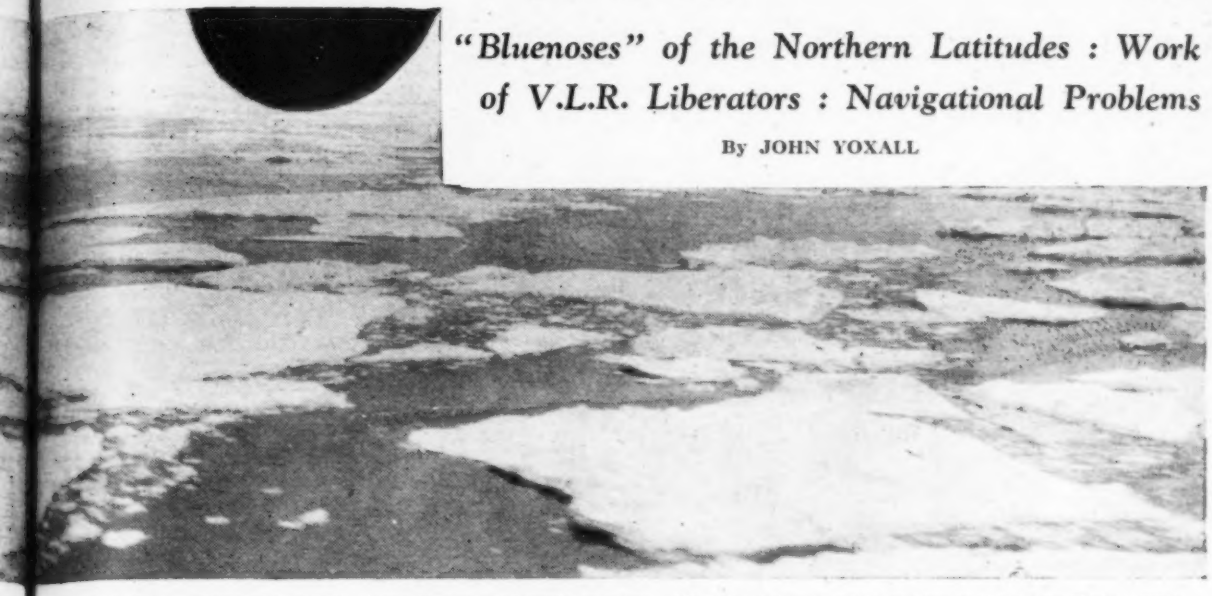
Trails and Holes

We followed one for over an hour. In one area large formations of 8th U.S.A.A.F. Fortresses crossed overhead going east to bomb some target in Germany. Their trails in the blue sky were prodigious, but as they entered the alto-cumulus they cut great holes in it. One explanation offered for this strange phenomenon is that the heat from the engines was just sufficient to evaporate the moisture droplets in the thin cloud. Another is that the turbulence caused by the aircrafts' passage mixed the cloud with the slightly warmer air of the inversion layer which is always to be found immediately above alto-cumulus formations.

My arrival, full of sympathy, was somewhat of an anti-climax. A dance had been fixed for that very night, and the decorations and catering were a credit to everyone concerned. How frequently this is the case in these "off-the-map" stations, where the personnel have to provide their own amusement. If

"Bluenoses" of the Northern Latitudes : Work of V.L.R. Liberators : Navigational Problems

By JOHN YOXALL



(Left) Depression over Iceland. A weather map of northern areas. (Above) Flying over the ice floes in the Arctic Circle. With the exception of the meteorologists on Jan Mayen island (69 deg. N.) the area is just empty desolation.

the fleshpots of a big city are handy, ordinary station functions are more or less neglected.

The next morning, in brilliant but cold weather, I searched out the navigation officer, Flt. Lt. Potter—popularly known as Gillie—to hear of the navigational problems of Arctic flying. Whatever aids might be given to combat Arctic conditions for aircraft and crew, the navigator's work remains both difficult and arduous when flying in high latitudes. Patrols sometimes last more than 16½ hours, and it has been found necessary to carry two navigators to share the work. All the remainder of the crew of twelve change round duties every hour, but the navigator's work is constant.

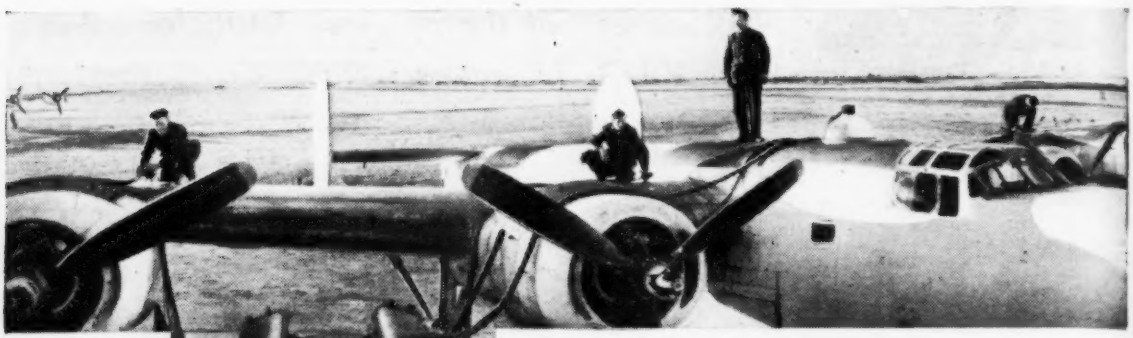
Compasses and Radio

Magnetic disturbances in the Far North are neither constant nor predictable, and the electrical disturbances usually concurrent with the Northern Lights seriously affect modern navigational aids. The earth field is weak, and even the distant-reading compass sometimes oscillates as much as 10 deg. All compasses have to be checked every thirty minutes, and, if the weather is good a fix is got from the sun or stars as a check on the instruments. All these navigational troubles, however, do not arise from magnetic or electrical disturbances. One of the major problems is the icing-up of wireless aerials, which renders the radio equipment useless.

Icing is, of course, a bugbear on these patrols. The leading edges of the wings, tailplanes and fins of the Liberators all carry the Goodrich pulsating rubber de-icers, and alcohol sprays have to be used to keep the windscreens and airscrews clear.

Some of the aircrews told of their experiences and reactions on these long flights, which cover huge areas from east to west and project far beyond latitude 70 deg. north. All agree that there is a definite psychological effect brought on by remoteness as soon as the Arctic Circle (66 deg. 33 min. N.) is crossed. There is always the thought that if for any reason the aircraft has to be ditched they are out of range of the Air/Sea rescue Warwicks.

BELIEVE IT OR NOT: The contents of this huge fuel tanker are insufficient to fill the tanks of a V.L.R. Liberator, which will take nearly 2,500 gallons.



Filling the tanks of a V.L.R. Liberator is a long job on which six men are employed.

ANTI-ICING: Ground crews, in their special winter clothing, spraying the wings of a Liberator with anti-frosting liquid. In bad weather this has to be done every three hours.

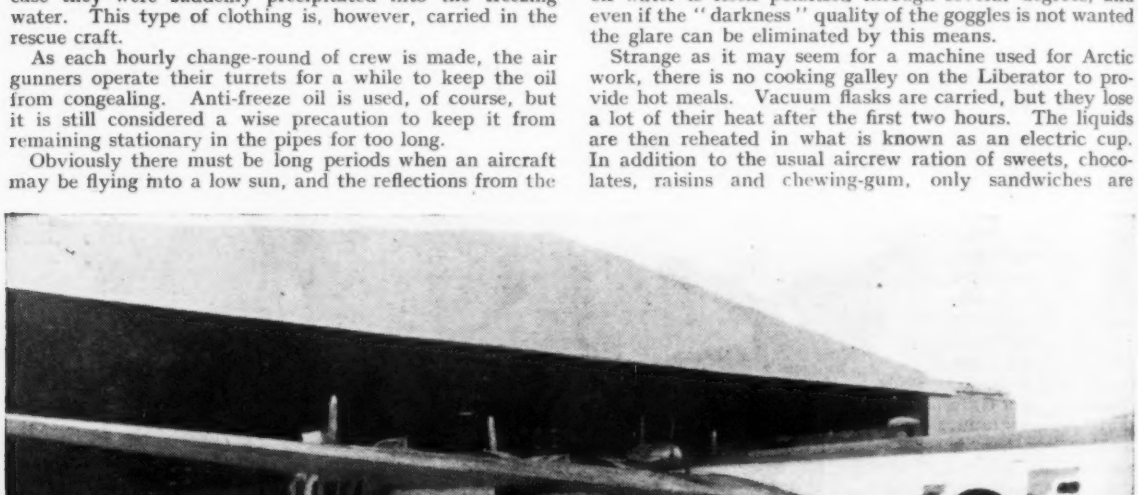
ARCTIC PATROL

which carry parachute lifeboats, and the crews are dependent on the weather being quiet enough for a Catalina to alight to pick them up. The patrols in summer are, of course, all in daylight because there is no night. During the winter it is nearly all night-flying, with Leigh-lights fitted under the wings of the Liberators. Heat from the engines keeps the men warm, and they fly in just ordinary tunics. It would appear wise to dress them in chemically heated clothing in case they were suddenly precipitated into the freezing water. This type of clothing is, however, carried in the rescue craft.

As each hourly change-round of crew is made, the air gunners operate their turrets for a while to keep the oil from congealing. Anti-freeze oil is used, of course, but it is still considered a wise precaution to keep it from remaining stationary in the pipes for too long.

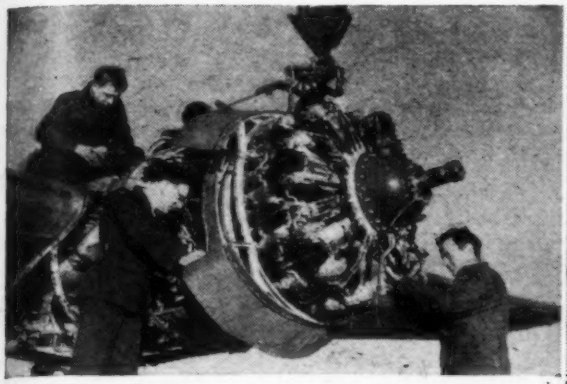
Obviously there must be long periods when an aircraft may be flying into a low sun, and the reflections from the water are very trying to the eyes. To overcome this the crews wear Polaroid goggles. These have two pieces of polarising material in each eyepiece, and, by turning the components so that the polar axes cross, any required degree of "darkness" can be obtained. Reflected light off water is itself polarised through several degrees, and even if the "darkness" quality of the goggles is not wanted the glare can be eliminated by this means.

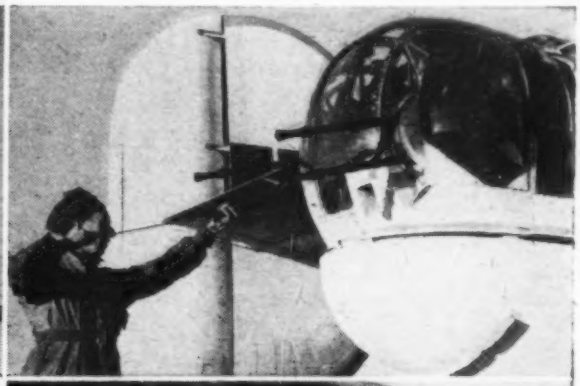
Strange as it may seem for a machine used for Arctic work, there is no cooking galley on the Liberator to provide hot meals. Vacuum flasks are carried, but they lose a lot of their heat after the first two hours. The liquids are then reheated in what is known as an electric cup. In addition to the usual aircrew ration of sweets, chocolates, raisins and chewing-gum, only sandwiches are

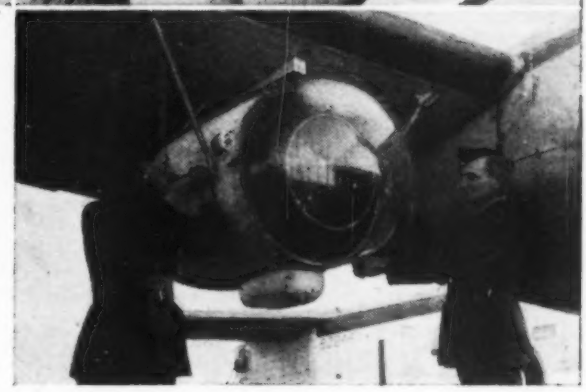


The station once housed only fighters, and the hangars are too small to take the Libs. Only the nose and engines can be got under cover.

ARCTIC PATROL







(Above) Changing an engine in the rare sunshine of late autumn in the north. The temperature is 3 deg. above freezing. (Top right) An armourer cleaning the ·303 guns of the rear turret. (Right) Attending to one of the 8-million candlepower Leigh-lights.

carried to provide more substantial food. It seems that there is a good opportunity here to issue some of the self-heating tinned foods such as are supplied to the troops.

Tired eyes play tricks with the imagination, and eyes can become very tired on a sixteen-hour patrol. One crew told me of seeing six whales in line abreast and of mistaking them for a U-boat pack. Another Liberator made an attack on a dead whale and lost a trailing aerial in the process. German submarines are now very difficult to see, especially in rough weather, because they are fitted with a device known as a "schnörkel." This is a double pipe which comes up to periscope height and forms an air intake and an exhaust pipe. This enables the U-boats to run their diesel engines whilst remaining submerged. Something which was actually seen but which was almost equally unbelievable was a U-boat well above 69 deg. and still steering due north. Beautiful sights are also to be seen at times. The Northern Lights appear in the sky like sun reflections on the ceiling from puddles of water, and even the desolation of the dreary waste of ice and water has a beauty entirely of its own.

Some Squadron Kills

The squadron game book is one long story of heroism and hard work—often with disappointing results. Attacks pressed home in a most daring fashion have resulted in only "probables," and depth charges have been known to hang-up in a most aggravating manner. Attacks have been made in almost every Arctic latitude, and, in the hectic days which followed the invasion of the Continent, less than 24 hours separated patrols for the aircrews. This squadron alone flew 98 sorties in June and 86 in July.

Here are just three of their successful attacks: Skipper, P/O. Moseley. Found U-boat fully surfaced and turning to port. Depth charges dropped and oil patch ½-mile in diameter appeared on the surface. Six survivors seen in water. The submarine had shot up the Liberator rather badly, yet the aircraft remained over its kill for a further 1½ hours. Skipper, F/O. (now Flt. Lt.) Smith. Heard from a Cansos, A for Apple, of a U-boat on surface. Closed and straddled it with depth charges. Last seen with bows vertical. Thirty survivors. Skipper, Flt. Lt. Parker. Heavy *flak* from submarine as run-in was made. Depth charges dropped from 50ft., but undershot. Second attack from dead astern. Three depth charges exploded alongside hull. Twenty survivors. Attack was also remarkable for the accurate shooting by the front gun.

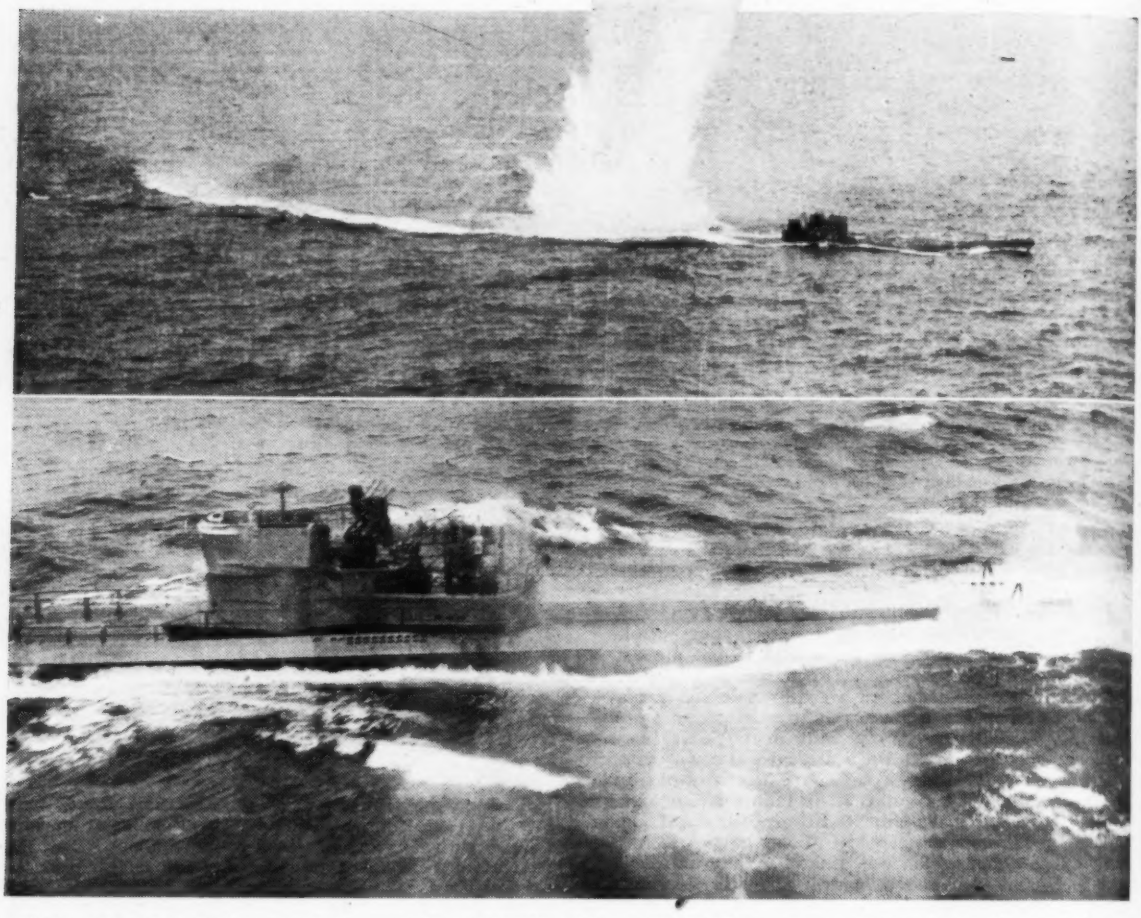
A Leigh-light Liberator is an interesting, if not comfortable, aircraft in which to fly. It is the biggest machine I know with no room in which to move about. The two navigators have to worm their way full length past the retracted nose wheel after the machine is in the air. This is because it is considered unsafe to have men in the nose during these very heavily loaded take-offs. When action stations are taken up, one navigator guides the Leigh-light and drops the depth charges while the other straddles his body and fires the 0.5 gun in the nose which serves as an anti-*flak* weapon.

Engines are started in the following order: starboard inner, starboard outer; port inner and port outer. They warm up at roughly 1,000 r.p.m. Ultra-violet lighting of the dashboard is turned on, and the pilot goes through a list of instrument-reading O.K.s with the second pilot and the flight engineer, who stands between them. (In the Liberator I the flight engineer had a separate panel, but in the later types all the dials are on the pilot's dash). The Hamilton hydromatic airscrews are tested next, and a row of four white lights appears as they reach either fully fine or fully coarse. Then, in the order 4, 3, 2, 1, the Pratt and Whitneys are run up to 2,600 r.p.m. These figures are shown by double-indicating hands on two dials.

Front-Wheel Float

Taxying on a Liberator has a queer nose-down feeling about it, and the long-travel nose wheel produces a distinct "float." It is a big machine, and it is usual to have a man sitting in the escape hatch in the roof while taxying round the perimeter. On the Lib. in which I flew there was a short exchange of pleasantries between our look-out and a bus driver who objected to leaving the runway. At the end of the 2,000-yard runway the Liberator turned into wind on a specially laid-out circle, and here the captain

ARCTIC PATROL



Photographs taken during an attack by a V.L.R. Liberator (Skipper, Flt. Lt. Harwood) on a U-boat in the Arctic. Three runs were made. The submarine opened fire at two miles and the first depth charges overshot by 50ft. As can be seen from the lower picture, the front-gun shooting was so good that the Germans are no longer manning their guns. Some of the gunners can be seen sprawling on the deck.

—Sqn. Ldr. Owen—went through a final list of O.K.s. Temperature and pressures were all checked; twenty degrees of flap put on; engine controls put into auto-rich position and the flying controls released.

Radio Altimeter

A run of some twenty-odd seconds saw the machine in the air, and one gets an impression that taking a Lib. off is a man's job. Almost immediately we were out over the sea in pitch blackness and at no very great height. This habit that Coastal Command have of flying low at night is a little disturbing at first. It would not be possible at all were it not for the radio altimeter. This instrument is very accurate and reliable. After a predetermined height has been set a series of lamps come into operation, showing whether the machine is above or below this height. During an attack when height is being lost it is the second pilot's job to watch for the red light and ease the stick back to prevent the machine diving into the sea.

Operation of the Leigh-light is both simple and effective. A voice comes over the inter-com. giving the range and direction as the target is closed. Then, when it is dead ahead and about a mile distant, the captain calls out "light," and there, in the midst of an 8-million candle-power beam, is the target outlined. From that point onwards the light is directed by hand until the target disappears beneath the nose. It is not always *quite* as accurate as that, but a good team will always get so close that only a very small adjustment has to be made after the Leigh-light is switched on.

The Liberator is fitted with a Honeywell-Minneapolis automatic pilot which is entirely electric in operation. All control-surface operation is done by electric motors, which are in turn controlled by wiper contacts on potentiometers. Just one dirty contact is liable to cause trouble, but the device has one great advantage: by turning a small knob at the top of the panel, the aircraft will automatically perform a perfectly banked turn to any degree of steepness required. This is very useful on a black night below 300ft. over the sea.

Aircraft Maintenance

Strangely enough, the maintenance side of V.L.R. work differs very little from that of ordinary Liberator bomber stations. Although the aircraft are constantly flying in a salt-laden atmosphere, and are never put in hangars, the employment of stainless steel and Alclad has solved the corrosion bogy. The only corrosion trouble experienced occurs in the constant-speed units of the airscrews, and this causes a degree of sluggishness in operation.

A much elaborated crest of a V.L.R. Liberator squadron. The eagerness with which the depth charges are tumbling out is a sheer delight.

This does not mean that life is at all easy for the ground crews. Nothing could be farther from the truth. These grand fellows ply spanner and screwdriver under most Spartan conditions. Often the damp atmosphere is well below freezing point and there is no cover at all from the elements. The men are provided with special weather - resisting clothing, but that does not make the handling of ice-cold tools any more pleasant. Later on in the winter everything will be under snow, but maintanance and flying will still go on. Ready and waiting are snow blowers and graders with heaps of salt and sand to keep the runways clear. The men will also have to spray anti-frosting alcohol on all the upper surfaces of operational aircraft once every three hours. Otherwise the ice would form all over the wings at a prodigious rate as soon as they got into the air.

One more tribute. The W.A.A.F. transport drivers up north do a real man's job of work, driving about in bad conditions of visibility over treacherous frozen surfaces. It was strange, but it certainly appeared as if all the oldest and most worn-out vehicles in the R.A.F. had congregated on this station, where one would have thought warm, dry vehicles are most essential.

VICKERS ARRANGEMENTS

NEW arrangements, following the death of Cdr. Sir Charles Craven, Bart, R.N., have been announced by Vickers, Ltd.

Mr. A. A. Jamieson, the chairman of the board, has been granted temporary leave of absence by all other companies with which he is concerned in order that he may devote the whole of his time and attention to his duties as chairman.

Sir Frederick Yapp is to be managing director; Sir James Callander and Cdr. E. R. Micklem, C.B.E., R.N., are to be directors, and Mr. J. Reid Young relinquishes the secretaryship of the company and is appointed director of finance and administration. Mr. E. J. Waddington, A.C.A., is to be secretary, and Mr. G. M. Dunbar, C.A., joint assistant secretary with Mr. J. A. F. Valentine.

Sir Frederick Yapp is also to be chairman of Vickers-Armstrongs, Ltd.; Cdr. E. R. Micklem, C.B.E., R.N., deputy chairman and managing director (engineering works and shipyards), and Major H. R. Kilner, M.C., managing director (aviation). Messrs. Reid Young, Waddington, Dunbar and Valentine will serve this company in the same respective capacities as for Vickers, Ltd.

At an early date Sir James Callander will relinquish his position as general manager of the Barrow works and will be succeeded by Mr. Hubert Thompson, who is at present deputy general manager of these works. Mr. P. H. Muirhead is to be deputy general manager of the Elswick, Scotswood and Chertsey works.

Sir Alexander Dunbar relinquishes the office of managing director of the English Steel Corporation, Ltd., and becomes chairman; Mr. F. Pickworth is to be general manager, and Cdr. Micklem a director.

Mr. J. Reid Young is also to be a director of the Metropolitan-Cammell Carriage and Wagon Co., Ltd., in place of Sir Frederick Yapp, who resigns.

CANADIAN AIR MINISTER RESIGNS

MR. C. G. POWER, Canadian Air Minister, has resigned "because he has opposed conscription for Overseas Service," it was officially announced in Quebec last week.

V.2 PARTS FOUND

PART of a V.2 bomb was recently found. It is shaped like two basins placed with their bases together, one being smaller than the other. It is not unlike the metal part of a hanging street lamp. The convex metal cover of the larger portion, which is approximately 2½ft. to 3ft. in diameter, appears to have been the case of the bomb. Upon it are 18 metal protuberances, which are apparently the propelling jets. This tallies with a photograph from Sweden recently published in *Flight*.

Round the circumference of the smaller of the two parts is a metal tube, from which lead sets of pipes, resembling the induction pipes of the engines of a large motor vehicle. These pipes lead to the larger portion of the object, and had apparently been joined to a chamber immediately behind the jets.

R.A.F. DELIVERS THE MAIL

DESPITE adverse weather conditions, an Air Supply group of R.A.F. Transport Command has just flown more than 1,800,000 lb. of freight and 48,000 lb. of troops' mail to the Western Front in one week. More than 66,000 lb. of mail and 1,290 casualties were brought back in the same period.

These freight and casualty carrying aircraft of Transport Command form the "Silent Service" of the R.A.F., says the Air Ministry News Service. Day by day, in fair weather and foul, they run a continuous shuttle between England and the European battlefields, their fuselages packed with urgent supplies.

When Germany is defeated these aircraft will be ready to switch over to the Far Eastern route—Transport Command has long operated a regular trunk route to India—and ensure a swift, steady stream of supplies and medical stores for the battle against the Japanese.

DR. LANCHESTER HONOURED

THE 1945 James Watt International Medal has been conferred on Dr. F. W. Lanchester, the famous pioneer in automobile and aviation engineering, and a contributor to *Flight*.

The medal is conferred by the Council of the Institution of Mechanical Engineers in collaboration with the engineering institutions of no fewer than 18 other countries.

AIR CADETS' FILM FOR NEW ZEALAND

A COPY of the A.T.C. film "Sons of the Air" is to be flown out to New Zealand at the special request of the R.N.Z.A.F. to be shown throughout the Dominion.

Air Marshal Sir Leslie Gossage, K.C.B., chief commandant of the A.T.C., last week presented the film to Air Commodore E. G. Olson, D.S.O., Air Officer Commanding, R.N.Z.A.F. in Britain, at an informal ceremony at the Air Ministry.

New Zealand has its own A.T.C., formed in October, 1941, and it now numbers some 10,000 cadets. Over 3,000 New Zealand air cadets have passed into the R.N.Z.A.F.; more than half an air crew.

Behind the Lines

Training Opportunities

ALLIED heavy bombing of German towns has placed at the disposal of German soldiers ample training grounds for practising house-to-house and street fighting, says a German newspaper.

Luftwaffe Losses

GERMAN air ace Lt. Kurt Ebner, who claimed to have shot down 32 aircraft over Stalingrad, has been killed on the Western Front.

The German radio also announced that Lt. Hermann Jochens, holder of the Knight's Cross, had failed to return from operations on the Eastern Front.

He was a successful long-distance reconnaissance pilot.

"Don't Think"

STOSSTRUPP, German army paper, was quoted by Moscow radio for these instructions to the German soldier:

You must be silent in order not to discourage your comrades.

You must stop your ears so as not to hear the voices whispering all around you.

Don't listen, don't read, don't notice —such is our slogan.

Stop thinking and do your duty.

V-2

COMMENTING on Allied air attacks on V-2 launching sites, the German Overseas News Agency said that the "long-range battle against England can in no way be influenced by these Allied attacks."

Berlin military circles point out that the launching technique of V-2 is basically different from that employed with the flying bombs.

Double Shifts

ALTHOUGH most of the German factories are already engaged on armament work, they want to raise their output even more.

According to the periodical *Deutsches Handwerk*, this is to be achieved by introducing a second shift in the crafts, too, wherever this is at all possible. This second shift will be possible wherever workshop space and technical equipment allow a fair number of workers to work simultaneously; in these cases it is expected that a second shift will contribute materially to increase the output. The report explains that women can supply the necessary labour.

The Afflicted

KÖLNISCHE ZEITUNG, commenting on Goebbels' address, writes: "Dr. Goebbels came for the *Führer*, the *loneliest and most afflicted of all*, because he, the statesman and war lord, must be the one most deeply affected by his allies' defection and the vicissitudes of the battlefields. But he has stood in the lowest depths of the abyss of defeat, he who saw his towns collapse under the destructive blows from the air, whose dearest general has been killed—*this man to-day is nevertheless the person most firmly convinced that a good end will deliver us from all our misery and present trials.*"

Service and Industrial News from the Inside of Axis and Enemy-occupied Countries

Stimulants for Production

A GERMAN Press article dealing with the conditions in armament factories gives these interesting details: "In important armament factories the 60-hour week has for long been a matter of course, and a considerable number of workers often put in 70 and more hours per week. The demands on individual effort are particularly great whenever the course of production does not allow intervals and if work has to be done under a uniform maximum strain, which applies to a very great extent to certain armament products. *The strain is even greater in enterprises which have been transferred underground* for greater protection against air attacks, so that daylight has to a great extent to be forgone and the supply of fresh air, despite the highly developed air-conditioning plants, is hardly comparable with that in factories above ground." In these underground factories mercury low-pressure lamps are used for lighting in which the ultra-violet rays are made visible by means of luminous substances. In consequence, these tube-lamps, one metre in length, which can be connected with any circuit of alternating current, give an artificial daylight such as could not be achieved by any other means.

"One may rightly ask how it is possible to attain such physical achievements, and it may be feared *that such a strain for any length of time would affect the health, for it is tantamount to a complete exhaustion of strength.* These apprehensions are, however, *offset* by the fact," says the writer, "that work has been going on under these conditions for years without even the beginnings of such a reaction being noticeable."

The article then mentions that the workers are supplied with warm food, medical attention, extra rations and holidays, etc., and continues: "Moreover, the workers are given special food in order to stimulate their flagging spirits. The most usual measure is to distribute sweets containing vitamin C. Stimulants mostly consist of colanut and caffeine ($C_8H_{10}N_4O_2$, a stimulating alkaloid normally found in coffee leaves and berries). A compound of chocolate and colanut constitutes a nourishing and stimulating food which, given in doses of up to 100 g. in the first stages of exhaustion, has increased working capacity by 20 to 25 per cent. Other products aim simply at stimulating, in which case sweets and other preparations (in small quantities, however) are chosen which contain caffeine and cola. The amount of the stimulant can be adjusted to individual circumstances. The latest method is to combine these stimulants with alcohol, making a liqueur which has proved exceptionally valuable for ensuring peak performances.

One can infer that the morale built on these stimulants is in itself synthetic.

Goose-stepping Fraus

THE call-up of women for service with searchlight units and for other *Luftwaffe* duties has torn fresh gaps in the German industry and administration, stated Herman Wagner, one of the Labour Front leaders.

Since the beginning of October several thousands of the Reich Labour Service women leaders and tens of thousands of girls have been transferred from the Labour service to the *Luftwaffe*.

Flak Misery

STRONG formations of well-camouflaged German A.A. artillery are reported to be employed on the Budapest front.

But according to a report by a visiting German correspondent they do not seem to be a very happy lot. "The A.A. gunners feel cold"—complains the writer—"the autumn gales have started to blow across the Hungarian Plain and the dampness of the Danube lowlands makes breathing difficult. Most of them are lance-sergeants and corporals. Five hard years of war have left their mark on their faces; they look unshaven . . ."

Dispersal

DESCRIBING the dispersal of armament industry the *Donauzeitung* says that the extensive transfer of the armament industry started in 1942 and since then all the more important factories were duplicated, so that if one factory was destroyed the workers and machinery had only to be moved to another one. "More important than this," says the article, "was the complete transfer of chemical, ball-bearing and machine-tool factories to parts of Germany less exposed to air attacks. Special trucks were constructed in order to effect this transfer. The factories were also often moved to neighbouring areas for short periods.

"On the whole the authorities were able to avail themselves of the premises of factories which had been closed because they were either out of date or unprofitable. The factories were equipped with lightning speed with salvaged and new machines and all the workers were transferred. After a few days operation production was only 30 per cent. to 40 per cent. below the normal level."

Another important measure was the setting up of machine depots everywhere. "Germany still has colossal stocks of the most modern machines," the writer asserts, "and it must not be forgotten that this machinery not only consists of German reserves but has also been acquired in the course of the occupation of various countries. Similar stocks are also available of chrome, manganese and other metals.

"A considerable part of the German war industry, particularly the aircraft industry, has been transferred underground. At first the cellars of destroyed factories were used and later on cellars were built underground. These days new plants are being blasted out of the rocks. These factories are no longer situated inside the towns, but near them. The surroundings—not only the entrances and exits, but also the railway stations and runways—are naturally camouflaged.

"Indicator" Discusses Topics of the Day

Controlling as a Career

The Importance of the "Man in the Chequered Box" : Recruiting Airfield Controllers : Necessary Experience : False Wartime Standards of Proficiency : Plonks, Prunes and Professionals

ONE of the many things that have "grown up" almost unnoticed during this war is the standard R.A.F. system of airfield control. So much so that on the rare occasions when a pilot visits a station where the system is not in operation he feels almost helpless as he wanders round the perimeter track with squealing brakes and his neck aching from the effort involved in trying to see where the possible runway in use might have its beginning. The chequered box is now a landmark in a waste of tarmac and parked aircraft, and little ideas like that of indicating the compass bearing of each runway make all the difference in the world when one is setting off from a strange airfield in thickish weather.

Presumably the system has come to stay and will be applied to civil as well as Service airfields after the war is over. The question now is: Who will man the various services involved in the proper use of the system after demobilisation? At the moment, since man-power, as such, is cheap during a war, there are no particular difficulties. Everyone has to do a war job of some kind, and if the Powers consider that the bright and intelligent young Smith is unfitted by his nature to be more than, say, an L.A.C., then his brightness and intelligence can be put to good advantage in the airfield control box, where he may be quite happy. Since he has been conscripted out of his normal work as a commercial artist (or whatever job it may be of the experience in which the Services can make no direct use), what he does is of little moment to him and he is only too glad to be doing work which involves him in the exercise of some common sense and quick thinking, when he might be cleaning lavatories or peeling potatoes.

Runways and Blind Alleys

But it will be a very different matter when he and his fellows have been granted their bowler hats; even if they have developed a liking for an active open-air life they are not likely to be prepared to sacrifice a career in return for some interesting blind-alley work on an airfield. And even the job of control officer *is* likely to be very much that and no more.

Yet if ever a high standard of intelligence and understanding is really and vitally necessary it is in the quite "low-grade" business of standing in the little chequered box giving the approaching pilots "greens" or "reds" as the case may be—and using expensive pyrotechnics when it is really necessary. It is certainly not a job which can be done by anybody, and the airfield managers of the future had better think again if it is their idea to give a local labourer a warm coat, an Aldis lamp, and a supply of cartridges, train him for a week or two, and hire him for life at a few pounds a week. It won't work. The only sort of man who can do the job really well is the kind who is good enough to do other and better jobs. It must, in fact, be the apprenticeship to the serious and worthwhile career of airfield controlling, with all that it entails in the way of responsible decisions.

As soon as it is agreed that all control work must be done seriously by a permanent staff, one's first idea is that it should be done by ex-aircrew personnel. In theory, that is a very sound scheme. In practice, however, it will be found that such personnel are not always suitable. The older retired pilots may have been retired for just the reasons which will make them partly unsuitable for any but a "chair" job—of which there will be very few available—while the younger "retireds" will be impatient and will certainly not be prepared to go through the mill.

That is going to be the basis of one of the major problems after this war; it will be impossible for the young flying man to realise that, however good he may be as a war pilot, whether operational or otherwise, he is not necessarily good at anything else, and that he must start at the beginning with all the others. Quite a few medium-old men have been flying in this war quite satisfactorily after running an entirely different peacetime business, and they know, after learning to fly at their own expense in the Auxiliaries or the V.R.s, that flying is merely a matter of mental and muscular dexterity and is no more important in general than a bank clerk's ability to play rugger well, or the stockbroker's golf handicap, though airline flying is a full-time occupation, war flying certainly is not.

Selection of Men

The Powers in the Air Ministry know all this quite well, and any high ranks go to the leaders of men and to the organisers, rather than to the pilots, who remain mere cyphers unless they happen to have some particular additional qualifications. Unfortunately, if one has chosen to fly, these other qualifications are rarely found or even looked for, and the average keen pilot suffers the anomaly because he would rather be a stooge aviator than a high-ranking stores officer or accountant—even if he knew he had the ability and patience to be either.

No, I don't think that the control personnel will necessarily be found amongst the aircrew people; rather will they be found among the very young enthusiasts who are keen on flying, but who are neither technically minded enough to be engineers nor suitable for (or wishing to become) pilots. They will do their year or two as airfield controllers, and then graduate to the control building. But they *must* have flying experience.

However good and quick-thinking and efficient he may be, an airfield controller can never be really good unless he can see every situation through the pilot's eyes—while retaining his understanding of the control plan in general. Not only must he fully understand what it actually feels like to be sitting in cloud on instruments with a not too satisfactory fuel situation after a six-hour flight and while waiting to be given a turn to land, but he must also appreciate fully the difference between the approach technique used for different types, so that he can know when it is reasonable for a small aircraft to "cut in" on a larger one. It is, for instance, no good expecting a fighter to make a multi-engined approach, or expecting a Tiger Moth to keep in circuit with a Liberator; the pilot of the latter will much prefer the former to cut in close and get it over rather than to sit at 65 m.p.h. above and being rapidly overtaken by him. In order that he may handle his Aldis lamp and his Verey pistol with due reticence, the airfield controller must know all about such things, and, in order that he shall not unreasonably tell off either the pilot or his airfield controller, the officer in the tower must, too, know all the answers.

There is, at the moment, far too great a tendency for the watch-tower experts to expect every aircraft to stick to a local "standard" in the matter of circuits and to shoot down any pilot who happens to use his common sense. There is a tendency, too, for airfield control to be over-systematised and for the control officers to forget that the pilots also have eyes and a measure of judg-

CONTROLLING AS A CAREER

ment of their own. For instance, a pilot approaching in an aircraft with a reasonable forward view can see for himself what is on the runway, and is in a much better position to judge the amount of room available behind the aircraft which has just landed than is the man on the end of the runway. As a matter of fact, the situation appears very much more tense to the approaching pilot than to the latter. Nothing is more annoying than to have a "red" fired at one because there is another aircraft, which can be seen quite well, on the runway; the "red" must, of course, be obeyed, since one is never quite certain that there may not be another and better reason for the pyrotechnic display.

So, even the man in the box should have already started his flying training. He will have obtained an "A" licence—for what it is worth—done a certain amount of demonstration dual on more advanced types, travelled as a useful member of the crew of a large aircraft on real jobs of work, and flown as second pilot on test trips in order to obtain an idea of different approach techniques and speeds. When he graduates to a more responsible organising job in the control tower he will have done a year or two on the airfield and quite a few useful hundred hours in the air. He will be earning a reasonable salary, and will have the knowledge that he will earn more in due course as well as that he is doing a good, useful and "decorous" job of work, with nothing blind-alley about it. Radio and administration will be taken in his stride.

Most of this, of course, was under way before the war started, and I am merely trying to make quite sure that the importance of the work is not under-estimated and that nobody has the idea that, because A. C. Plonk manages very well at the end of the runway any old person will do. The much-despised A. C. Plonk may, in private life, be an experienced cracksman or a manager of a business, the services of a quick-thinking and intelligent man thus being obtained by the Service for a mere song.

"INDICATOR."

Air Route Facilities

Control, Cost and Regularity : Debate at R.Ae.S.

LAST week we published the talk by Mr. E. W. Hives on civil aircraft engines, given at the recent all-day debate at the Royal Aeronautical Society. Below is a summary of the talk by Mr. W. P. Hildred, Director-General of Civil Aviation, and of the subsequent discussion. The talk dealt with air route facilities, such as airports, radio and meteorology.

MR. W. P. HILDRED, C.B., O.B.E., M.A., said that he would prefer to raise the question of the trend of matters rather than talk about the different types of ground facilities.

He set down ground organisation in four categories. The first thing was the airfield, which might be a small meadow in any embryonic form from which one could develop to the multiple-runway airport. One of the factors of outstanding importance was the difference in basic cost between the primitive airports of earlier days and the extreme development that would be necessary for future aircraft of high loading.

Of meteorology Mr. Hildred said it seemed to him that some sort of international organisation was necessary. There should be observers at different points sending out observations at predetermined times in such a manner that charts could be prepared which would be intelligible to any nationality. He thought meteorology set the pace for internationalism, and hoped the unification already achieved might be followed in other matters which concerned aircraft and flight. With the airfields and meteorological services established, there must be a control system to co-ordinate every movement of aircraft. This must include the collection of evidence about expense and the provision of safety measures. This information could not be obtained without a whole network of increasingly expensive economics. All these things were growing everlastingly more expensive.

Whilst it was agreed that the ground organisation should, so far as possible, be on the ground, further consideration made it clear that this could not always be achieved. In order to use an airfield, an aircraft had to have an undercarriage, but this stole a certain amount of pay load. Furthermore, it was not possible to give the captain proper meteorological information and navigational direction without at least giving him a radio set. As a member of the Air Radio Advisory Committee he had listened with great interest to the increasingly elaborate devices made possible by radar development. Again came to his mind the amount of pay load likely to be stolen by putting on board an aircraft the sort of devices which modern ingenuity had made possible.

Radio Power and Control

It might be a long day before we had an aircraft that obtained its motive power, direction and guidance completely from a radio power station instead of from power units on board, but it would be quite possible to have an aircraft almost completely controlled from the ground without any other control in the aircraft than an efficient radio receiving set. The cost, however, would be absolutely prohibitive.

Mr. Hildred stressed the question of cost because it was conventional policy in most countries for the cost of ground organisation to be met by the State. There were two points he would like to put up for discussion. The first: was it necessary in the interests of safety and regularity to incur any particular item of cost, and, secondly, if the answer was "yes," should that cost be met by the Government, by the municipality, or by the operator, who stood to lose in his ineffective pay load, or should it be passed on to the customer in the form of increase in fares?

On the question of regularity, Mr. Hildred said that, in spite of poor weather in Europe, operators managed to achieve 97 per cent. regularity. In achieving this, at any rate by the operators on a small scale in this country, there was a present of 1s. 9d. for every aircraft-mile flown. Was the extra 3 per cent. needed to give 100 per cent. regularity worth the cost?

Were the developments now being planned in connection with ground facilities, particularly radar, having the right effect on pilots? Were we packing our brains into boxes and selling them in an endeavour to reach perfection at the expense of the five senses? Personally he wondered whether the pilot of the future would not owe a little too much to the technical perfection of mechanical devices.

He asked should an aircraft be capable, allowing for modern perfection of various devices, of navigating itself, or should we pass over to a state of affairs in which it was nothing but a bead running along a string. Was ground organisation tending to spoil the skill of the modern pilot, and, if so, was that a good thing? We wanted to know how many things would be wanted, how many could be done without, and how many were vital.

DR. ROXBEE COX, referring to the need for reducing drag, said some basis other than drag co-efficient was needed, since this depended so much on wing loading. The real criterion was the drag per unit of weight. It might even be the unit of drag per load or per unit of useful load, or something of that sort.

He would like to comment on what had been said concerning the undesirability of having a complete power unit and just dumping it into the aircraft. If it were possible to get the low drags which he believed were generally agreed to be essential, then it should be possible to design the engine and apparatus as a whole, with the engine influenced in its shape and disposition by the requirements of the aerodynamics of the structure, the latter being at the same time influenced by the nature of the engine. This had been brought home to them very much in recent years in the proper exploitation of the gas turbine. Here there were so many variations possible that in a given instance it should be possible to achieve a power plant installation which not only in power but in sheer geometrical shape was best adapted to the particular specifications. If work was continued on those lines, there was a chance of bringing the drag down. The effect of that would be even more valuable than in the past, because with the gas turbine reduction of drag would make the engine more adaptable. He concluded by pleading for a very careful analysis to be made of the way in which the drag of the aircraft was compared.

MR. GARROD, referring to the initial cost of aircraft, assumed two machines, each weighing 55 tons. Due to variable factors, one of the aircraft cost £150,000 and the other £200,000. Therefore, the more expensive machine had to earn amortisation over a period of five years on an extra £50,000, or £10,000 per annum. Assuming the aircraft did 100 round trips of the Atlantic per annum, to pay for the extra capital charges it would be necessary to carry one extra passenger at £100 per round trip. Thus the initial cost was related to the efficiency of the aircraft, and, looking at the matter in another way, was it economical to spend up to another £50,000 to achieve a small saving in weight? He would very much like to have other views on this point, because he felt that the question of initial cost should be put into a better perspective in relation to the pay load an aircraft must carry.

SIR FREDERICK HANDLEY PAGE was not sure he agreed with Mr. Chadwick about the conventional type of aircraft holding the field for some time. Looking forward, could it be said that there would come in the future other factors which would help to reduce drag and of which full account could be taken so that a cruising speed of 300 m.p.h. could be maintained? Unless there was something "in the bag" by way of drag reduction, etc., he did not think cruising speeds would be substantially increased. However, he thought there were two things "in the bag": one was laminar-flow wings and the other jets. What had to be considered was the manner in which these would basically affect design so that it would be economical to cruise at 300 m.p.h.

Chicago

Agreement Reached on Many Points, but Several Still Outstanding

ATTEMPTS to cut the Gordian knot, or rather a series of Gordian knots, appear to have failed at Chicago when we went to press with this issue. Opposition to the suggested international authority as visualised by British representatives had been expected. Great Britain, Canada and the U.S. worked together on a modified form of international administration and a draft was submitted. This proposed that the administration should comprise an assembly and a board of directors, the latter to consist of 14 members and a president. It was suggested that seven of the 14 should represent the seven member States of chief importance in air transport. Four points still in dispute were omitted from the draft: the freedoms of the air; adjustment of capacity to traffic offering; treatment of United Nations members; and denunciation of participation in the agreement. A joint sub-committee representative of all the nations taking part in the conference, approved those parts of the suggested air convention agreed upon by Britain, Canada and the U.S., but proposed that the title of the international body should be changed to International Air Organisation, and that the board of directors should consist of 21 members instead of 14.

On the subject of traffic control, Canada suggested that growth of traffic offering could be taken care of by allowing any nation whose aircraft capacity was filled to 60 per cent. or more extra accommodation. This so-called "escalator" clause, however, was considered to link up closely with one of those very debatable ones, the right to pick up and set down traffic at intermediate points. U.S.. representatives advocated this "freedom," but Lord Swinton regarded it as a possible encroachment upon traffic rightly belonging to the smaller countries. He pointed out, at a press conference, that any country along an international air route is deeply interested in what happens along that route, and particularly in the "short hauls."

Lord Swinton also stated that to ensure fair treatment Britain would insist on a clause which would give the devastated countries a breathing spell to re-establish their air lines or to establish new ones. In the case of Europe he suggested a period of three years from the fall of Germany, and for India, Australia and other Far Eastern countries, a three-year period after the fall of Japan. At the time of going to press, this "fifth freedom" to collect and discharge traffic at intermediate points is still being debated.

Mr. H. J. Symington, one of the Canadian representatives, made an impassioned plea to the conference not to shirk the controversial problems. "The world expects more from us," he said. The same sentiment was also voiced by Mayor LaGuardia, of New York, who said: "I beg you not to give up. You must send an assurance back to these small devastated countries which are starting again from scratch that the causes of the trouble are being eliminated."

THE FUTURE OF I.A.T.A.

Secretary-General Accepts Invitation from America

A TIMELY exchange of views between air transport operators from this and other countries, and the formation of their own international organisation, will go a long way to support the fragile body of international aviation. Any international authority which may emerge from the present Chicago Conference will find, in such an organisation, a valuable source of expert council from men with long practical experience in the daily problems of operating aircraft and in international collaboration.

It is, therefore, refreshing to hear that the air transport operators are gradually getting together and are taking steps to build their own world-wide organisation.

In these efforts they have one substantial advantage: their past record of international collaboration. The International Air Traffic Association (I.A.T.A.), which was started in 1919 on the initiative of Mr. Holt Thomas counted at the outbreak of this war a membership of 29 air transport companies representing 24 countries from every part of the world. During that period the I.A.T.A. has—in close collaboration with other international bodies—effectively furthered the interests of civil aviation.

International Collaboration

The considerable measure of success attained by the I.A.T.A. in the pre-war days is a pointer to what can be expected from the revival of this organisation. Revival is, perhaps, not a happy word, for clearly the I.A.T.A., which, like many other international bodies, has suspended its activities during the war, will have to be reorganised in harmony with the general aviation set-up agreed upon by the United Nations. Should an international Air Authority be created with reasonably wide powers, it is clear that some of the work which before the war was left within the domain of the air transport companies will be decided on the higher inter-governmental level. On the other hand, the progress made by air transport during this war, and the expected development after, will necessitate a collaboration of air transport operators from all over the world and some regional organisation. Indeed, the efficiency of international routes will to a large extent depend on the measure of such international collaboration.

It is to be hoped that a reconstructed I.A.T.A. will embrace the European, American and Asiatic operators of international routes, and it seems that the importance of such world-wide organisation is appreciated by aviation leaders on the other side of the ocean.

On November 11 the Secretary-General of the I.A.T.A. received a telegram from Col. Gorrell, president of the Air Transport Association of America, inviting him to come to the States to discuss the formation of a world-wide organisation of air operators.

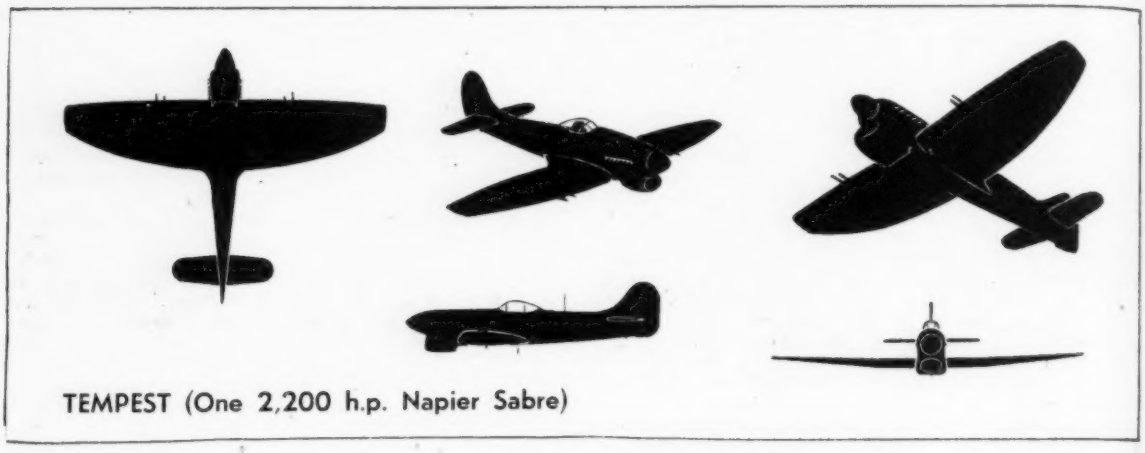
An informal meeting was held by representatives of the following 15 members of the pre-war I.A.T.A.: A.B.A. (Sweden); Aeroput (Yugoslavia); Air France (France); B.O.A.C. (Great Britain); C.S.A. (Czechoslovakia); C.L.S. (Czechoslovakia); D.D.L. (Denmark); D.N.L. (Norway); K.L.M. (Netherlands); L.O.T. (Poland); N.E.A. (Great Britain); P.A.A. (U.S.A.); Sabena (Belgium); Swissair (Switzerland); and Tata (India), as well as Grp. Capt. Makowski, Polish Air Force, former president of the I.A.T.A.; Mr. D. H. Handover, president of the Traffic Committee of the I.A.T.A.; Rear-Admiral Riiser-Larsen, Norwegian Air Force; and Major Beaumont, member of the Legal Committee of the I.A.T.A. The meeting agreed that Dr. Goedhuis should accept this invitation and adopted a resolution expressing the belief "that a world-wide organisation of air transport operators is essential to the development of international air transport, and that due to the experience of I.A.T.A. during its 25 years of existence the International Association of Air Operators should be built on this organisation adapted to meet new circumstances."

One can only hope that the forthcoming talks in America will produce a basis for a world-wide line-up of those who shoulder the actual responsibility for air transport and that the American companies will join in.

In the past the principle of equality of vote and the keeping out of political subjects were the main reasons for I.A.T.A.'s success in international collaboration. One may expect that air transport operators will have enough vision to form a basis for their future association suited to the changed conditions of the world.

Studies in Recognition

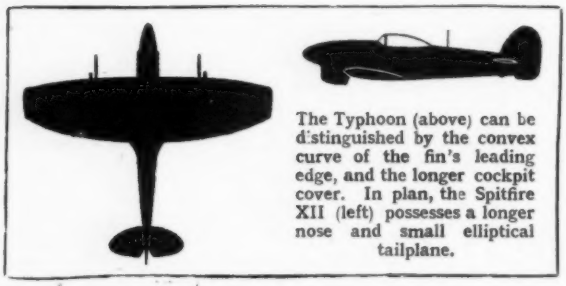
Aircraft in Flying Attitudes



TEMPEST (One 2,200 h.p. Napier Sabre)

IT is always dangerous to say that one particular type of aircraft is "the latest and fastest" of the R.A.F.'s modern fighters, because the censor always lags miles behind current accomplishments in design and performance; besides, one never quite knows if yet another mark of Spitfire or Mosquito has emerged—behind one's back as it were—which is capable of some secretly terrific pace as yet unmentionable. But allowing for this sort of contingency, plus the officially admitted fact that British jet-propelled fighters were used operationally against the "doodle bug," it may perhaps be guardedly claimed that the Hawker Tempest, with its 2,200 h.p. Napier Sabre engine and four 20 mm. cannon, is the fastest orthodox fighter of which mention may be made at present.

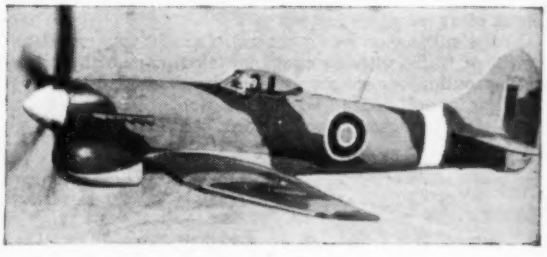
The Tempest was first officially admitted to be actively operational when it was busy knocking down flying bombs between the Pas de Calais and "the London area." It was, in fact, one of the very few orthodox fighters capable of catching a "doodle bug" on level terms; most others had to sit well upstairs and collect the necessary m.p.h. by diving on them.



The Typhoon (above) can be distinguished by the convex curve of the fin's leading edge, and the longer cockpit cover. In plan, the Spitfire XII (left) possesses a longer nose and small elliptical tailplane.

From the recognition angle, the Tempest does not really present anything of a problem, despite the fact that, from different viewpoints, it resembles two other first line fighters fairly closely. From head-on and side views it does not greatly differ from its sister Typhoon, while in plan view its wings are strongly suggestive of the "clipped" Spitfire. There are, however, sufficiently obvious differences to rule out any real danger of confusion.

Undoubtedly the hardest of all positions from which to tell the Tempest from the Typhoon is head-on. True, the fuselage of the Tempest is a trifle slimmer, but unless the two types were side by side to provide direct comparison, it is very doubtful if this could be detected. The shape of the frontal section, of course, is as good as identical with

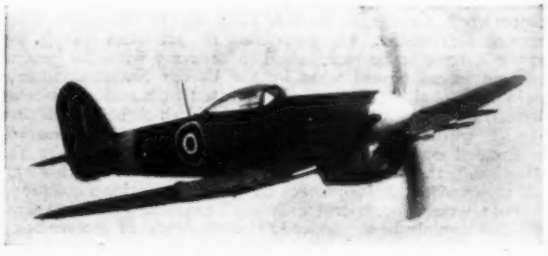


Hawker Tempest Single-seater Fighter (2,200 h.p. Napier Sabre) most resembles the Typhoon from a side view.

the bulge of the combined radiator and oil cooler beneath the large spinner. What *should* be readily recognised apart once one has compared them, however, is the Tempest's very much thinner wing and the much closer spacing of each wing's pair of cannon.

From the side view the obvious difference lies in the leading edge of the fin; on the Typhoon it is convex, on the Tempest it rises from the rear deck of the fuselage in a smooth, concave curve. Other small differences are that the Tempest has a smaller cockpit cover than has the Typhoon, and apart from the necessary interruption of this "teardrop" the top-line of the fuselage is virtually flat whereas that of the Typhoon is slightly convex.

In plan view the Tempest's elliptical wings with clipped tips immediately transfer resemblance from the Typhoon to the Spitfire, the similarity being clearly illustrated by the adjacent silhouette of the Spitfire XII. But apart from the Tempest's greater aspect-ratio, the "Spit's" long slim nose and elliptical tailplane promptly identify it. Dimensions of the Tempest are, span 41ft., length 38ft. 3in.



Hawker Typhoon IB Single-seater.

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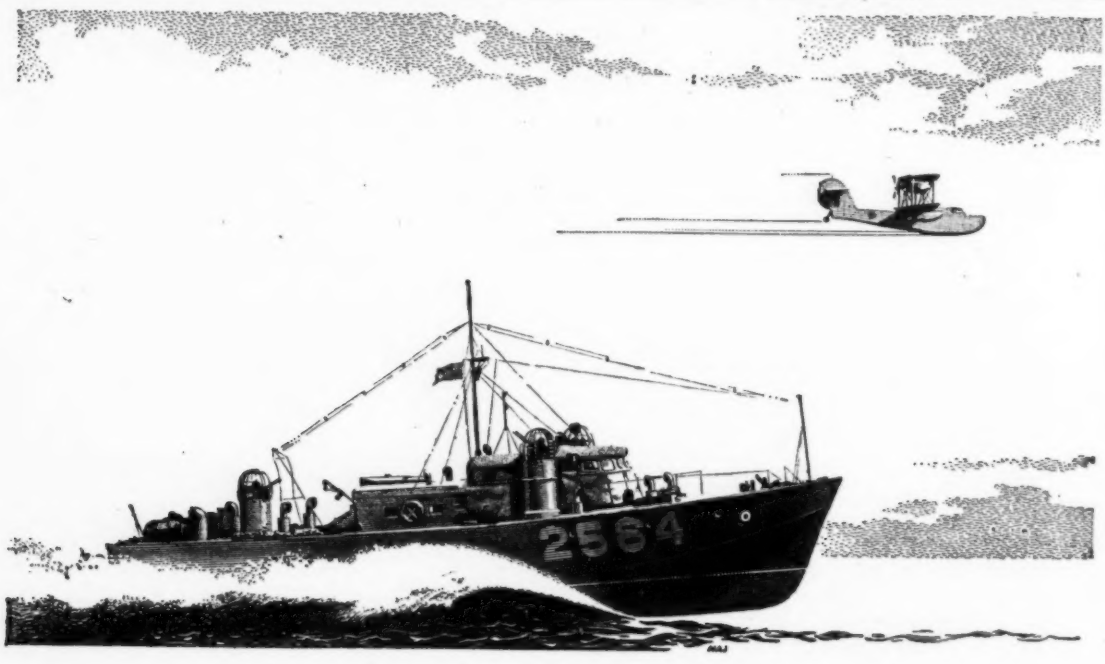

VOSPER
AIR SEA RESCUE CRAFT

CORRESPONDENCE

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THE HANDLEY PAGE HERMES
Why Should the Camel Kneel ?

AS a very keen reader of *Flight*, I should like to join my fellow-reader "Cameleer" (*Flight*, November 2nd) in congratulating you on the H.P. Hermes article and supplement. The idea of an undercarriage which will lower the aircraft to enable passengers to emplane seems quite absurd, however.

Might I suggest that the poor designer has quite enough to worry about without having to pay so much attention to pampering the passengers? And what a trivial discomfort it would be to walk a few feet up a sloping floor. It really seems that this craze for super-comfort for the passengers is being carried too far.

ALFRED RATTLE.

IMPLICATIONS OF V.2
Its Interplanetary Possibilities

NOW that the existence of V.2 and some details of its performance have been revealed, we wish to draw attention to certain implications of immense importance from the scientific as well as the military point of view.

At the apex of its trajectory, V.2 reaches a height of at least 60 miles. If, however, it were used purely for *vertical* ascent, and not, as in practice, for largely horizontal motion, its performance would be even more impressive.

If we assume the initial mass, at take-off, to be 15 tons, and the propellant employed, liquid oxygen and alcohol, it is possible to calculate with a fair degree of accuracy the velocity V.2 would attain in *vertical* ascent. It is of the order of three miles a second (10,000 m.p.h.), and this would permit the rocket to rise about 800 miles against gravity. (In practice, V.2 may not exceed 3,000 m.p.h., owing to air resistance in the lower levels of the atmosphere. The effect would be almost negligible in a vertical ascent.)

Nor is this all, for if the one-ton war-head were replaced by a smaller portion of V.2 of substantially the same fuel/payload ratio, *this rocket would never return to the earth at all.* Such a rocket would carry about 100 lb. of instruments of the radio-transmitting type used in balloon ascents, and it could carry them not only into *space*, but to the *moon itself*.

The scientific importance of such an experiment need not be emphasised, and it is clearly only a matter of time before manned rockets can be produced and sent into space with sufficient control and fuel reserves to return to earth.

Although we may deplore the perversion of the rocket by the Nazis, we must not let this blind us to the dazzling possibilities now opening up before us, so much sooner than even the most ardent interplanetary enthusiast ever dared to predict.

K. W. GATLAND,
For the Combined British Astronautical Societies.

POST-WAR CIVIL AVIATION
Time to Prepare a Labour Policy

LESS has been written about the problem of labour's contribution to the coming era of civil aviation than of any other facet of this much-vexed topic. Yet, despite the tremendously important political and financial interests involved, the labour question is one which will be of most vital interest to the vast majority of people who will be "in" aviation.

There appears to be no prepared labour policy emanating either from the Government or from the airline operators and potential operators. From their own point of view it would appear that this is an omission which should be rectified if they are to begin operations with a highly skilled staff on call for service in any part of the world.

Needless to say, this point has been debated at length wherever R.A.F. technical personnel forgather, and, largely as a result of the opinions of these people, the Aeronautical Engineers' Association was born, to present to the aviation world the ideas of those who will almost certainly be the labour force of to-morrow's airlines.

What they want to see is a proper standard set, by the new Ministry of Civil Aviation if possible, of the persons who will be permitted to act as craftsmen on the maintenance of passenger-carrying aircraft. It is not enough to have a licence. These can be obtained easily, so far as technical ability is concerned, by anyone who has had a minimum of actual experience. What is required is the setting of an examination and trade test, similar to the R.A.F. tests for fitters, and the issue of a certificate to successful candidates.

Again, it has been widely recommended by various interests that the necessary qualification is inherent in an engineering apprenticeship. Not so. There are hundreds and hundreds of R.A.F. and Air Ministry civilian tradesmen who entered the service long past the apprentice age of sixteen to eighteen, but who, in five years of war, have really mastered the art of aircraft maintenance. Certainly these people are entitled to a fair "break" with apprentice-trained men, whose apprenticeship may well have been unconnected with aircraft.

From whatever angle one looks at the problem, it is obvious that if civil aviation is to get the best men available—and anything short of that will spell disaster—it must be settled on a basis of the individual merit and intelligence of each potential civilian ground engineer.

This Association, probably the only registered trade union catering purely for R.A.F. and Air Ministry technical personnel, is basing its policy on the assumption that airline operators will take the progressive and commonsense view in their labour plans, and accordingly is preparing its members to enter their new field of endeavours as the most efficient, highly trained and mobile labour force in the history of British engineering.

J. H. STEVENSON.

THE FLYING BOAT
Its Advantages Reiterated

MAY I ask why we have heard so little of flying boats in connection with British post-war flying? There is little doubt that the flying boat's place in civil aviation is connected chiefly, if not solely, with the large airliners and freight carriers.

It appears that the chief argument against the F.B. lies in the fact that the bases and airports are too inaccessible, and that too much of the time saved by flying is lost in mooring up and transporting passengers and freight to their final destination.

Aircraft will not, at least for a very long time, be able to compete with shipping in freight carrying. However, the flying boat is in the best position to overcome the difficulties which will face heavy aircraft.

Ships, like F.B.s, lose time in docking or mooring, so we can put the time saved by flying down as clear profit for the F.B. Time taken by shipping to moor and unload its cargo is not likely to shorten. But the F.B. is saving time with every technical improvement added. For instance, taxying in unfavourable weather conditions has made many a pilot wish he were on wheels, and often caused time to be lost. However, with the incorporation of the reversible airscrew many difficulties will be overcome, and much time saved, due to the improved manœuvrability.

Another invention is the simplified beaching method (U.S.) described in *Flight*, November 9th. Surely with an efficient organisation and slight improvements the flying boat will be able to come up the slip immediately after alighting, without being moored to a buoy at all. This would facilitate immensely the unloading of cargo, and rid the passenger of the apparently dreaded journey in a motor launch.

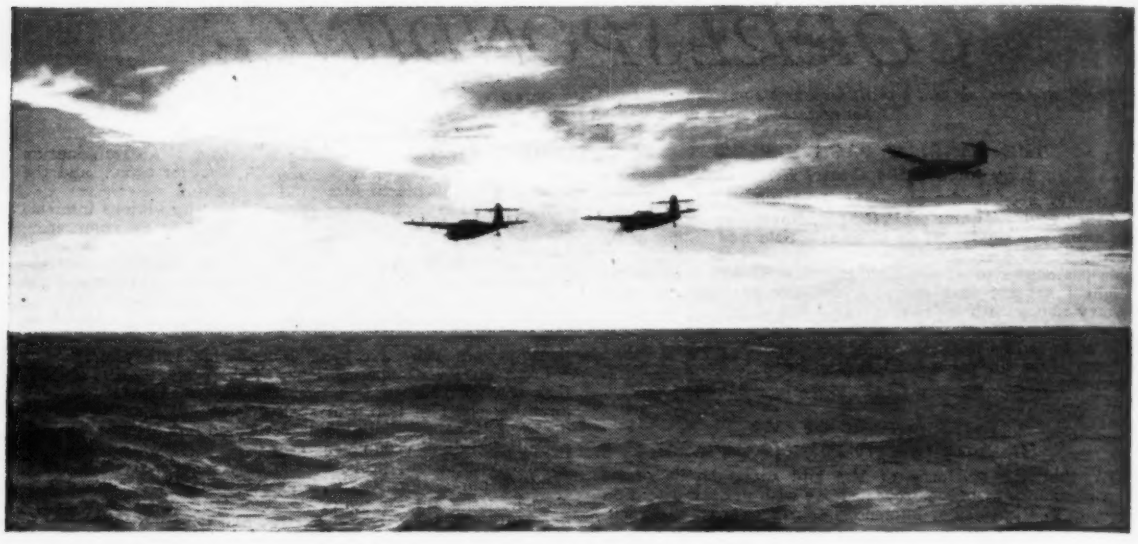
One of the biggest headaches of landplane designers must be the undercarriage and take-off space.

The undercarriages of to-day have to support a colossal weight on three points, which makes the pressure at these points very considerable, necessitating the addition of a good deal of unwanted weight. The flying boat, on the other hand, does not have to face these difficulties. Also, if the double hull is designed, the floats or sponsons can be abolished, and so lessen even more the "unpaying" weight.

Runways or landplanes will have to call a halt some time or other to their race for size. So far the landplane has increased its weight, and the runway has had to increase its length and strengthen its foundation. Again, the flying boat has the advantage in that as it grows it can cope with increasingly rougher water (to a point), and so our already widespread ports can be used for flying boat bases. Hence the F.B. will not be handicapped so much by a lengthy take-off.

I think passengers will be happier in a flying boat (psychological reasons) when flying on our over-water Empire routes.

"ARRAPH."



Fairey Barracudas from aircraft carriers of the Home Fleet on their way to attack enemy shipping in the Bodö area.

SERVICE AVIATION

Royal Air Force and Fleet Air Arm News and Announcements

Promotions

GENERAL DUTIES BRANCH.

Air Comdres. (temp. Air Vice-Marshals) to be Air Vice-Marshals (June 1st, 1944):—
R. GRAHAM, C.B., C.B.E., D.S.O., D.S.C., D.F.C.
D. HARRIES, C.B., A.F.C.

Group Capts. (temp. Air Vice-Marshals) to be Air Comdres. (June 1st, 1944):—
A. P. M. SANDERS, C.B., C.B.E.
E. A. B. RICE, C.B., C.B.E., M.C.
R. HARRISON, C.B., C.B.E., D.F.C., A.F.C.
A. C. CULLIER, C.B., C.B.E.
W. F. DICKSON, C.B., D.S.O., O.B.E., A.F.C.

The following Air Vice-Marshals are granted the acting rank of Air Marshal:—
R. V. GODDARD, C.B., C.B.E. (Oct. 1st, 1944).
J. M. ROBB, C.B. D.S.O., D.F.C., A.F.C. (Oct. 15, 1944).

Group Capt. (temp. Air Comdre.) A. C. H. SHARP to be Air Vice-Marshal (Oct. 19th, 1944).

Group Capt. (Act. Air Comdre.) E. C. HUDDLESTON, C.B.E., to be Air Vice-Marshal (Nov. 10th, 1944).

EQUIPMENT BRANCH.

Group Capt. (temp. Air Comdre.) W. J. B. CURTIS, C.B.E., to be Air Comdre (June 1st, 1944).

Appointments

THE Air Ministry announces the following appointments:—

Air Vice-Marshal J. J. BREEN, C.B., O.B.E., to be head of Planning Executive Air Ministry, and to be Act. Air Marshal.

Air Vice-Marshal H. W. L. SAUNDERS, C.B., C.B.E., M.C., D.F.C., M.M., to be Director-General of Postings, Air Ministry.

Air Vice-Marshal J. B. COLE-HAMILTON, C.B., C.B.E, to be A.O.C. of a group in Fighter Command.

Act. Air Vice-Marshal T. A. LANGFORD-SAINSBURY, O.B.E., D.F.C., A.F.C., to be A.O.C., Egypt.

Act. Air Vice-Marshal G. S. HODSON, C.B.E., A.F.C., to be A.O.C. of a group in Bomber Command.

Air Comdre. K. B. LLOYD, C.B.E., A.F.C., to be A.O.C., Malta, and to be Act. Air Vice Marshal.

Awards

Fleet Air Arm

FOR distinguished services in successful attacks on enemy shipping while operating with the Royal Air Force:—

Distinguished Flying Cross

Temp. Sub Lt. (A) R. GOWLAND, R.N.V.R.

Royal Air Force

THE KING has been graciously pleased to approve the following awards in recognition of gallantry displayed in flying operations against the enemy:—

Distinguished Service Order

Wing Cdr. P. M. BROTHERS, D.F.C., R.A.F.O.—Wing Cdr. Brothers is a courageous and outstanding leader whose splendid example has inspired all. He has led large formations of aircraft on many missions far into enemy territory. Much of the success obtained can be attributed to Wing Cdr. Brothers' brilliant leadership. He has destroyed thirteen enemy aircraft.

Act. Sqn. Ldr. J. A. PLAGIS, D.F.C., R.A.F.V.R., No. 64 Sqn.—Since being awarded the D.F.C., this officer has participated in very many sorties, during which much damage has been inflicted on the enemy. Shipping, radio stations, oil storage tanks, power plants and other installations have been amongst the targets attacked. On one occasion he led a small formation of aircraft against a much superior force of enemy fighters. In the engagement five enemy aircraft were shot down, two of them by Sqn. Ldr. Plagis. This officer is a brave and resourceful leader, whose example has proved a rare source of inspiration. He has destroyed sixteen hostile aircraft.

Act. F/O. D. BEATON, R.A.F.V.R, No. 514 Sqn.—As pilot and captain of aircraft, F/O. Beaton has completed many operational sorties against a variety of targets in Germany and occupied territory. In September, 1944, he took part in a daylight attack on Le Havre. Whilst over the target the aircraft sustained severe damage when struck by anti-aircraft fire and temporarily went out of control. F/O. Beaton was badly wounded, suffering a broken leg and multiple wounds caused by flying fragments of shell. Although in great pain, he regained control and set course for home. Making light of his injuries, he refused to leave the controls and flew back to an airfield near the coast, where he landed his damaged aircraft safely. This officer displayed outstanding courage and fortitude. Though severely wounded, he never wavered in his determination to bring his aircraft and its crew home. His example was most inspiring.

Bar to Distinguished Flying Cross

Flt. Lt. M. J. GLOSTER, D.F.C., R.A.F.V.R., No. 219 Sqn.—Since the award of the D.F.C., Flt. Lt. Gloster has flown on many operational sorties, and his keenness to engage the enemy on all occasions is outstanding. He has destroyed at least ten enemy aircraft.

F/O. L. GREENBURGH, D.F.C., R.A.F., No. 514 Sqn.—This officer has displayed the highest standard of skill, bravery and fortitude in air operations.

Act. Sqn. Ldr. J. G. BENSON, D.F.C., R.A.F.V.R., No. 157 Sqn.—Sqn. Ldr. Benson has completed a large number of sorties. He has been responsible for the destruction of at least five enemy aircraft and six flying bombs; he has also effectively attacked several locomotives and supply trucks. This officer has shown a fine fighting spirit, and his gallantry and determination have been exceptional.

Act. Sqn. Ldr. J. C. WELLS, D.F.C., R.A.F., No. 609 Sqn.—Sqn. Ldr. Wells has led the squadron and, on other occasions, larger formations of aircraft in many attacks on difficult targets. He has displayed the highest standard of skill and resolution, and his leadership has been most inspiring. Among his achievements, Sqn. Ldr. Wells has destroyed six enemy aircraft.

Flt. Lt. M. H. PINCHES, D.F.C., R.A.F., No. 122 Sqn.—Flt. Lt. Pinches has now destroyed four more enemy aircraft and damaged several others. He continues to display a fine fighting spirit and great gallantry.

Flt. Lt. J. G. GREY D.F.C., R.N.Z.A.F., No. 627 Sqn.—Since being awarded the D.F.C., this officer has completed many sorties as captain of aircraft. He has at all times displayed a high sense of duty and undiminished enthusiasm. The majority of his sorties have been against very heavily defended targets in Germany, where his imperturbability and steady determination in the face of heavy enemy opposition have greatly contributed to the successes achieved.

Act. Sqn. Ldr. J. V. WATTS, D.F.C., R.C.A.F., No. 109 Sqn.—This officer is a very capable and conscientious officer. He has completed a large number of sorties since the award of the D.F.C. These have necessitated a high degree of navigational skill, and excellent results have frequently been achieved. His skill and determination have always been of a very high order.

Act. Flt. Lt. H. C. HOOVER, D.F.C., R.C.A.F., No. 35 Sqn.—This officer is an outstanding pilot and captain of aircraft. He has completed numerous night operations against the enemy and has at all times pressed home his attacks in spite of enemy opposition. Flt. Lt. Hoover has displayed great tenacity and determination to achieve his objective, and his skill, courage and coolness in action have set a fine example to his crew.

Act. Flt. Lt. J. A. T. SIMPSON, D.F.C., R.C.A.F., No. 109 Sqn.—Since the award of the D.F.C., Flt. Lt. Simpson has completed a number of sorties and has continued to display outstanding skill. Excellent results have been obtained on many of his missions, all of which have required a very high degree of determination, courage and ability.

Flt. Lt. W. G. FINLAY, D.F.C., R.N.Z.A.F., No. 109 Sqn.—This officer has an excellent operational record. He has completed many sorties, the majority of them against very strongly defended enemy targets, including Berlin. His high sense of duty and efficiency make him a valuable officer to his squadron.

Distinguished Flying Cross

Sqn. Ldr. W. F. WALLINGTON, R.A.F., No. 107 Sqn.
Sqn. Ldr. H. V. ELLIS, R.A.F.V.R.
Flt. Lt. D. V. C. COTES-PREEDY, G.M., R.A.F.O., No. 56 Sqn.
Flt. Lt. J. McD. CRAIG, R.A.F.V.R., No. 219 Sqn.
Lt. J. D. DUFF, S.A.A.F., No. 34 (S.A.A.F.) Sqn.
Flt. Lt. H. F. SCOTT, R.A.F.V.R., No. 100 Sqn.
Flt. Lt. J. H. SPURGEON, R.A.F.V.R., No. 502 Sqn.
Flt. Lt. P. J. URLWIN-SMITH, R.A.F.V.R., No. 502 Sqn.
Flt. Lt. R. BIRRELL, R.A.F.V.R., No. 605 Sqn.
F/O. J. P. ALLAN, R.A.F., No. 236 Sqn.
F/O. R. E. BARCKLEY, R.A.F.V.R., No. 3 Sqn.
F/O. R. H. CLAPPERTON, R.A.F.V.R., No. 3 Sqn.
F/O. P. J. COWGILL, R.A.F.V.R., No. 219 Sqn.
F/O. B. KNEATH, R.A.F.V.R., No. 151 Sqn.
F/O. W. D. TOPPING, R.A.F.V.R., No. 75 (N.Z.) Sqn.
F/O. D. T. TULL, R.A.F.V.R., No. 219 Sqn.
F/O. R. L. B. WALL, R.A.F.V.R., No. 219 Sqn.
F/O. J. F. WELSH, R.C.A.F., No. 254 Sqn.
Flt. Lt. E. A. CAMPBELL, R.C.A.F., No. 514 Sqn.
F/O. A. K. NORTH, R.C.A.F., No. 426 (R.C.A.F.) Sqn.
F/O. J. P. PATTERSON, R.C.A.F., No. 432 (R.C.A.F.) Sqn.
Flt. Lt. G. K. PAXTER, R.N.Z.A.F., No. 7 Sqn.
Flt. Lt. D. G. GOODWIN, R.N.Z.A.F., No. 7 Sqn.
F/O. T. H. I. FLEMING, R.N.Z.A.F., No. 166 Sqn.
F/O. F. C. FOX, R.N.Z.A.F., No. 75 (N.Z.) Sqn.
F/O. G. M. GIVEN, R.N.Z.A.F., No. 578 Sqn.
F/O. S. W. HOLDER, R.N.Z.A.F., No. 115 Sqn.
F/O. L. D. MCKENNA, R.N.Z.A.F., No. 101 Sqn.
Wing Cdr. J. B. VOYCE, R.A.F., No. 635 Sqn.
Wing Cdr. R. C. E. LAW, R.A.F.V.R., No. 109 Sqn.
Wing Cdr. D. M. WALBOURN, D.S.O., R.A.F.V.R., No. 582 Sqn.
Sqn. Ldr. D. I. FAIRBAIRN, R.A.F., No. 57 Sqn.
Sqn. Ldr. W. SPOONER, R.A.F.V.R., No. 582 Sqn.
Sqn. Ldr. D. W. A. STEWART, R.A.F.V.R., No. 514 Sqn.
Flt. Lt. I. L. T. ACKROYD, R.A.F.V.R., No. 105 Sqn.
Flt. Lt. N. ARMIN, R.A.F.V.R., No. 139 Sqn.
Flt. Lt. D. K. BRADLEY, R.A.F.V.R., No. 101 Sqn.
Flt. Lt. G. E. DICKSON, R.A.F., No. 49 Sqn.
Flt. Lt. R. FISHER, R.A.F.V.R., No. 115 Sqn.
Flt. Lt. N. D. GREENAWAY, R.A.F.V.R., No. 582 Sqn.
Flt. Lt. R. H. HAMER, R.A.F.V.R., No. 432 (R.C.A.F.) Sqn.
Flt. Lt. I. B. HAYES, R.A.F., No. 635 Sqn.
Flt. Lt. R. A. V. HAZLEHURST, R.A.F.V.R., No. 102 Sqn.
Flt. Lt. L. HENSON, R.A.F.V.R., No. 635 Sqn.
Flt. Lt. W. E. JEAVONS, R.A.F.V.R., No. 61 Sqn.
Sqn. Ldr. C. A. FRASER-PETHERBRIDGE, R.A.F.V.R., No. 35 Sqn.
Flt. Lt. D. W. JONES, R.A.F.V.R., No 571 Sqn.
Flt. Lt. E. G. KINCH, R.A.F.V.R., No. 90 Sqn.
Flt. Lt. R. LAVERACK, R.A.F.V.R., No. 76 Sqn.
Flt. Lt. E. S. NICOLL, R.A.F.V.R., No. 571 Sqn.
Flt. Lt. J. H. ROBSON, R.A.F.V.R., No. 139 Sqn.
Flt. Lt. D. J. STREET, R.A.F., No. 582 Sqn.
Flt. Lt. B. M. ACOTT, R.A.F.V.R., No. 61 Sqn.
Flt. Lt. J. H. BERRY, R.A.F.V.R., No. 7 Sqn.
Flt. Lt. J. H. BLACKADDER, R.A.F.V.R., No. 635 Sqn.
Flt. Lt. D. BRADY, R.A.F.V.R., No. 49 Sqn.
Flt. Lt. R. COATES, R.A.F., No. 149 Sqn.
Flt. Lt. R. COOPER, R.A.F.V.R., No. 156 Sqn.
Flt. Lt. J. F. CRAIK, R.A.F.V.R., No. 635 Sqn.
Flt. Lt. M. DOCHERTY, R.A.F.V.R., No. 199 Sqn.
Flt. Lt. W. W. DOY, R.A.F.V.R., No. 214 Sqn.
Flt. Lt. J. FORDE, R.A.F.V.R., No. 35 Sqn.
Flt. Lt. N. V. GILL, R.A.F.V.R., No. 622 Sqn.
Flt. Lt. R. G. FUNNELL, R.A.F.V.R., No. 218 Sqn.
Flt. Lt. G. F. W. GILLESPIE, R.A.F.V.R., No. 405 (R.C.A.F.) Sqn.
Flt. Lt. F. B. GIPSON, R.A.F.V.R., No. 582 Sqn.
Flt. Lt. R. K. W. GLOVER, R.A.F.V.R., No. 61 Sqn.
Flt. Lt. R. GUNTON, R.A.F.V.R., No. 214 Sqn.
Flt. Lt. R. L. C. HAZLEHURST, R.A.F.V.R., No. 192 Sqn.
Flt. Lt. L. H. HEMMING, R.A.F.V.R., No. 115 Sqn.
Flt. Lt. J. D. HOGG, R.A.F.V.R., No. 635 Sqn.
Flt. Lt. H. G. HORNSBY, R.A.F.V.R., No. 35 Sqn.
Flt. Lt. T. W. LEMM, R.A.F., No. 158 Sqn.
Flt. Lt. J. M. MACCOSS, R.A.F.V.R., No. 51 Sqn.
Flt. Lt. M. W. MILLS, R.A.F.V.R., No. 35 Sqn.
Flt. Lt. D. S. PARRY, R.A.F.V.R., No. 90 Sqn.
Flt. Lt. A. G. PETTITT, R.A.F.V.R., No. 405 (R.C.A.F.) Sqn.
Flt. Lt. J. H. ROLLINS, R.A.F.V.R., No. 35 Sqn.
Flt. Lt. G. G. SMITH, R.A.F.V.R., No. 625 Sqn.
Flt. Lt. R. A. SQUIRE, R.A.F.V.R., No. 166 Sqn.
Flt. Lt. C. A. P. THOMSON, R.A.F.V.R., No. 97 Sqn.
Flt. Lt. H. W. WARNER, R.A.F.V.R., No. 35 Sqn.
Flt. Lt. C. WILSON, R.A.F.V.R., No. 156 Sqn.

SERVICE AVIATION

F/O. A. ADAMS, R.A.F.V.R., No. 7 Sqn.
F/O. E. BARRACLOUGH, R.A.F.V.R., No. 78 Sqn.
F/O. D. A. BEATON, R.A.F.V.R., No. 214 Sqn.
F/O. A. E. BESWICK, R.A.F.V.R., No. 78 Sqn.
F/O. I. C. BLAIR, R.A.F.V.R., No. 78 Sqn.
F/O. R. BLUNDELL, R.A.F.V.R., No. 51 Sqn.
F/O. A. BOSWARD, R.A.F.V.R., No. 9 Sqn.
F/O. J. BOSWELL, R.A.F.V.R., No. 78 Sqn.
F/O. S. CARTWRIGHT, R.A.F.V.R., No. 460 (R.A.A.F.) Sqn.
F/O. R. S. CASS, R.A.F.V.R., No. 90 Sqn.
F/O. H. W. CATLIN, R.A.F.V.R., No. 51 Sqn.
F/O. A. J. B. CHILDS, R.A.F.V.R., No. 428 (R.C.A.F.) Sqn.
F/O. G. B. COLLINS, R.A.F.V.R., No. 431 (R.C.A.F.) Sqn.
F/O. G. CONSTANTINE, R.A.F., No. 90 Sqn.
F/O. M. S. EDMONDS, R.A.F.V.R., No. 76 Sqn.
F/O. D. EGGLESTON, R.A.F.V.R., No. 50 Sqn.
F/O. D. FITZGERALD, R.A.F., No. 10 Sqn.
F/O. A. N. FRANKLAND, R.A.F.V.R., No. 50 Sqn.
F/O. E. FRIEND, R.A.F.V.R., No. 101 Sqn.
F/O. W. J. FRY, R.A.F.V.R., No. 433 (R.C.A.F.) Sqn.

Air Chief Marshal Sir Arthur Tedder, Deputy Supreme Commander, talking with aircrews during a visit to R.A.F. airfields in Holland.

F/O. P. B. H. FURLONG, R.A.F.V.R., No. 103 Sqn.
F/O. C. W. GILBERT, R.A.F.V.R., No. 582 Sqn.
F/O. O. M. GILMOUR, R.A.F.V.R., No. 431 (R.C.A.F.) Sqn.
F/O. W. GORLEY, R.A.F.V.R., No. 78 Sqn.
F/O. C. GRATTON, R.A.F.V.R., No. 625 Sqn.
F/O. P. A. E. GRINTER, R.A.F., No. 514 Sqn.
F/O. F. W. HUCKERBY, R.A.F.V.R., No. 76 Sqn.
F/O. W. HUTCHINSON, R.A.F.V.R., No. 166 Sqn.
F/O. D. JACKSON, R.A.F.V.R., No. 78 Sqn.
F/O. J. A. JACKSON, R.A.F.V.R., No. 578 Sqn.
F/O. D. R. JONES, R.A.F.V.R., No. 166 Sqn.
F/O. A. A. JOSEPH, R.A.F.V.R., No. 635 Sqn.
F/O. W. F. LANGSTON, R.A.F.V.R., No. 103 Sqn.
F/O. R. H. W. LAWRENCE, R.A.F.V.R., No. 50 Sqn.
F/O. H. C. MACLENNAN, R.A.F.V.R., No. 514 Sqn.
F/O. W. A. MCCORMICK, R.A.F.V.R., No. 640 Sqn.
F/O. M. MALINS, R.A.F.V.R., No. 466 (R.A.A.F.) Sqn.
F/O. H. F. S. MITCHELL, R.A.F.V.R., No. 9 Sqn.
F/O. F. NORTON, R.A.F.V.R., No. 61 Sqn.
F/O. M. J. O'LOUGHLIN, R.A.F.V.R., No. 51 Sqn.
F/O. W. ORMSON, R.A.F.V.R., No. 433 (R.C.A.F.) Sqn.
F/O. N. C. PETTY, R.A.F.V.R., No. 166 Sqn.
F/O. W. J. REES, R.A.F.V.R., No. 149 Sqn.
F/O. A. J. ROBSON, R.A.F.V.R., No. 428 (R.C.A.F.) Sqn.
F/O. L. T. RAYNSFORD, R.C.A.F., No. 429 (R.C.A.F.) Sqn.
F/O. R. T. REID, R.C.A.F., No. 61 Sqn.
F/O. H. B. RHUDE, R.C.A.F., No. 617 Sqn.
F/O. G. MCC. ROGERS, R.C.A.F., No. 423 (R.C.A.F.) Sqn.
Flt. Lt. L. M. WILSON, R.N.Z.A.F., No. 77 Sqn.
Act. Flt. Lt. A. T. KING, R.N.Z.A.F., No. 218 Sqn.

Distinguished Flying Medal

Sgt. W. A. DONALDSON, R.A.F.V.R., No. 514 Sqn.
Flt. Sgt. W. R. HOYLE, R.A.F.V.R., No. 206 Sqn.
Flt. Sgt. F. M. KERBRAT, R.C.A.F., No. 90 Sqn.
Sgt. W. J. STONEMAN, R.A.F.V.R., No. 138 Sqn.
Flt. Sgt. J. R. CHURCHILL, R.C.A.F., No. 578 Sqn.
Flt. Sgt. (now P/O.) B. W. FOSTER, R.C.A.F., No. 419 (R.C.A.F.) Sqn.
Flt. Sgt. (now W/O.) A. G. ABBOTT, R.A.F.V.R., No. 405 (R.C.A.F.) Sqn.
Flt. Sgt. P. BAILEY, R.A.F.V.R., No. 51 Sqn.
Flt. Sgt. J. BELL, R.A.F.V.R., No. 622 Sqn.
Flt. Sgt. D. H. BOON, R.A.F.V.R., No. 218 Sqn.
Flt. Sgt. C. BRADLEY, R.A.F.V.R., No. 51 Sqn.
Flt. Sgt. C. A. BRADSHAW, R.A.F.V.R., No. 635 Sqn.
Flt. Sgt. H. E. BROMLEY, R.A.F.V.R., No. 101 Sqn.
Flt. Sgt. C. W. BUFFHAM, R.A.F., No. 7 Sqn.
Flt. Sgt. J. S. BURN, R.A.F.V.R., No. 582 Sqn.
Flt. Sgt. R. P. CANE, R.A.F.V.R., No. 100 Sqn.
Flt. Sgt. N. COHEN, R.A.F.V.R., No. 635 Sqn.
Flt. Sgt. G. D. COOKE, R.A.F.V.R., No. 625 Sqn.
Flt. Sgt. J. F. COULES, R.A.F.V.R., No. 138 Sqn.
Flt. Sgt. R. W. GUMBERS, R.A.F.V.R., No. 35 Sqn.
Flt. Sgt. E. R. DIAPER, R.A.F.V.R., No. 51 Sqn.
Flt. Sgt. C. W. EYLES, R.A.F.V.R., No. 35 Sqn.
Flt. Sgt. W. FERRY, R.A.F.V.R., No. 101 Sqn.
Flt. Sgt. A. G. GOULDING, R.A.F.V.R., No. 51 Sqn.
Flt. Sgt. J. HARRISON, R.A.F.V.R., No. 405 (R.C.A.F.) Sqn.
Flt. Sgt. R. A. HEARNE, R.A.F.V.R., No. 15 Sqn.
Flt. Sgt. E. HOLLIDAY, R.A.F.V.R., No. 635 Sqn.
Flt. Sgt. A. HORN, R.A.F.V.R., No. 76 Sqn.
Flt. Sgt. D. J. HUGHES, R.A.F.V.R., No. 156 Sqn.
Flt. Sgt. A. O. KENNEDY, R.A.F.V.R., No. 44 Sqn.
Flt. Sgt. V. A. LANE, R.A.F.V.R., No. 626 Sqn.
Flt. Sgt. A. W. LUNN, R.A.F.V.R., No. 51 Sqn.
Flt. Sgt. M. MCCAFFERY, R.A.F.V.R., No. 51 Sqn.
Flt. Sgt. T. C. MCLACHLAN, R.A.F.V.R., No. 582 Sqn.
Flt. Sgt. H. J. MARR, R.A.F.V.R., No. 622 Sqn.
Flt. Sgt. R. J. MARTIN, R.A.F.V.R., No. 100 Sqn.
Flt. Sgt. A. W. H. MATTHEWS, R.A.F.V.R., No. 103 Sqn.
Flt. Sgt. J. MUIR, R.A.F.V.R., No. 51 Sqn.
Flt. Sgt. J. W. TAYLOR, R.A.F.V.R., No. 7 Sqn.
Flt. Sgt. G. F. A. OBIEDZINSKY, R.A.F.V.R., No. 587 Sqn.
Flt. Sgt. L. F. OWEN, R.A.F.V.R., No. 405 (R.C.A.F.) Sqn.
Flt. Sgt. W. G. PARTON, R.A.F.V.R., No. 78 Sqn.
Flt. Sgt. L. A. PERRIS, R.A.F.V.R., No. 578 Sqn.
Flt. Sgt. B. PINNER, R.A.F.V.R., No. 101 Sqn.
Flt. Sgt. D. RAINTON, R.A.F.V.R., No. 15 Sqn.
Flt. Sgt. M. RANSOME, R.A.F.V.R., No. 76 Sqn.
Flt. Sgt. J. REID, R.A.F.V.R., No. 7 Sqn.
Flt. Sgt. D. N. J. SCOTT, R.A.F.V.R., No. 76 Sqn.
Flt. Sgt. J. H. SCOTT, R.A.F.V.R., No. 433 (R.C.A.F.) Sqn.
Flt. Sgt. M. A. SHARP, R.A.F.V.R., No. 635 Sqn.
Flt. Sgt. N. W. STRATHEARN, R.A.F.V.R., No. 75 (N.Z.) Sqn.
Flt. Sgt. F. W. STROUD, R.A.F.V.R., No. 44 Sqn.
Flt. Sgt. E. G. A. C. SWEET, R.A.F.V.R., No. 625 Sqn.

THE KING has been graciously pleased to approve the following awards:—

M.B.E. (Mil.)

Act. Flt. Lt. G. T. LIPSCOMBE, R.A.F.V.R., R.A.F. Regiment.—In June, 1944, Flt. Lt. Lipscombe was supervising the throwing of live grenades under field conditions, using a fold in the ground as cover. A grenade thrown by an airman fell short and hit the ground between himself and the crest of the fold. It rested about 10 feet from where the airman and Flt. Lt. Lipscombe were standing. Flt. Lt. Lipscombe immediately threw the airman to the ground and lay on him to afford him protection, although this brought the officer to within seven feet of the grenade; the latter exploded without injuring anyone. This officer then persisted in instructing the airman who threw another grenade which fell to the ground in a similar position. Flt. Lt. Lipscombe unhesitatingly repeated his previous action to protect the airman. After the second grenade had exploded he at once continued to instruct the airman who finally threw a third grenade successfully. By his prompt action and unselfish conduct, Flt. Lt. Lipscombe prevented what might have been a fatal accident, and he instilled a high degree of confidence into the whole class.

Act. Flt. Lt. H. S. HARBOARD, R.A.F.V.R.—In July, 1944, a Typhoon aircraft which had been damaged by enemy action crashed on to eight aircraft in the marshalling area on an airfield. The Typhoon burst into flames and set fire to

three of the other aircraft. Flt. Lt. Harboard leapt on to the fire engine and, on arrival at the scene of the crash, unhesitatingly fought his way through the heat and flames. With the aid of L.A/C. Eason he succeeded in extricating the pilot from the cockpit of the Typhoon and in removing his burning clothing, despite the explosion of the petrol tanks. This officer and airman displayed high courage and undoubtedly saved the life of the pilot.

George Medal

W/O.1 (now P/O.) R. J. HOOKER, R.C.A.F., No. 431 (R.C.A.F.) Sqn.—This airman was wireless operator/air gunner of a bomber aircraft which crashed and caught fire immediately after taking off on an operational flight in July, 1943. As he was leaving the wreckage W/O. Hooker saw movement in the front of the aircraft. He went forward and, finding the flight engineer wounded and unconscious, he dragged him from the burning aircraft and left him some distance away. W/O. Hooker returned to the wreckage and extricated the bomb aimer who was also wounded and unconscious. He then dragged both airmen further away from the crash. While returning to the scene a third time in order to ascertain whether all members of the crew were accounted for, one of the bombs in the aircraft exploded and W/O. Hooker was thrown to the ground. By his prompt action and total disregard of danger this airman saved the lives of two members of the crew.

B.E.M. (Mil.)

Flt. Sgt. D. S. MORGAN, R.A.A.F., No. 630 Sqn.—One night in June, 1944, Flt. Sgt. Morgan was the air bomber in an aircraft which attacked an objective in the Rhineland. While over the target the bomber was attacked by an enemy fighter and serious damage was sustained. Course was set for home, but the aircraft was so difficult to control that Flt. Sgt. Morgan was required to assist the pilot and flight engineer to keep the aircraft on its course. When this country was reached all attempts to turn the bomber on to its course for base were unavailing and it was impossible to attempt a landing. The pilot ordered the crew to escape by parachute and, as the rear gunner's parachute had been destroyed by cannon fire from the enemy fighter, Flt. Sgt. Morgan volunteered to share his own parachute with the rear gunner. Unfortunately, the rear gunner was dislodged when the parachute opened but Flt Sgt. Morgan landed safely. He displayed complete disregard for his own safety, knowing that he faced the risk of serious injury in his gallant attempt to save the life of his companion.

L.A/C. C. E. J. EASON, R.A.F.V.R.—For citation see Flt. Lt. HARBOARD, O.B.E.

Sgt. J. S. EADIE, R.A.F.V.R., No. 422 (R.C.A.F.) Sqn.—In February, 1944, an aircraft in which this airman was serving as wireless operator collided with a high-tension cable and crashed in flames. Two of the crew were killed and seven were injured. Sgt. Eadie, however, escaped injury. Although he was soaked in engine oil, he gallantly re-entered the blazing aircraft and rescued a crew member who was trapped and unconscious. He passed him out of the aircraft to a civilian who had arrived to help in removing the injured. Sgt. Eadie again entered the aircraft and, with the assistance of the civilian, helped three other members of the crew to safety. He did not leave the wreckage until the whole of the crew had been accounted for. During this time the aircraft was burning furiously and ammunition exploding. Sgt. Eadie's courage and complete disregard for his personal safety were of a very high order.

Sgt. J. A. FARNATH, R.A.F.—One night in April, 1944, a Wellington aircraft crashed on take-off. The crew abandoned the aircraft but the starboard engine was left running. When Sgt. Farnath reached the scene petrol was pouring from the starboard wing tanks and two 500lb. bombs were lying beneath the starboard inner plane. Realising the danger to other aircraft and personnel in the vicinity should an explosion occur, Sgt. Farnath entered the cockpit in an endeavour to stop the engine. The controls, however, were jammed. He then went to the back of the engine and, with great difficulty, owing to the terrific slip-stream and heat coming from the engine which was running at some 3,000 r.p.m., he managed to remove the side cowling and, by operating the cut-out control, was able to stop the engine. This operation took 20 minutes to complete. His initiative and disregard for his own safety undoubtedly saved a number of aircraft from blowing up or being burnt out. He has previously exhibited similar initiative and devotion to duty.

Cpl. E. L. BOND, R.A.F.V.R.—In April, 1944, a Wellington aircraft crashed at the end of the runway shortly after becoming airborne. Cpl. Bond was first on the scene and immediately assisted the rear gunner out of his turret. By then the fuselage was burning furiously. Shouts were now heard from inside and Cpl. Bond realised that the only means of escape was through the rear turret. He received assistance from another airman and, together, they grabbed the guns and managed to revolve the turret dead astern thus enabling an air crew member who had been trapped inside the fuselage to enter the turret. The air crew member locked the turret doors and attempted to turn the turret to port. He found that it would not move so Cpl. Bond instructed him to hold the lock up and operate the manual control. Whilst the turret was then being turned round to port a large explosion occurred. Cpl. Bond was not deterred, however, and he finally held the air crew member's harness and dragged him to safety. By his courage and promptitude, he saved the life of a colleague.

Cpl. R. P. MILLER, R.A.F.V.R.—In April, 1944, an Oxford aircraft crashed and caught fire; the pilot was trapped by his feet and unable to release himself. Cpl. Miller, who was in the vicinity, hurried to the scene of the accident and immediately endeavoured to extricate the airman who was surrounded by the flames. Whilst the rescuer was thus engaged, an explosion occurred, followed by several minor explosions. Despite this and the intense heat, Cpl. Miller persisted in his rescue efforts, but was unable to free the pilot. Meanwhile, two American officers had arrived on the scene with a fire extinguisher taken from their car. Cpl. Miller then went back into the flames and, aided by the officers and an American soldier (a driver), he succeeded in extricating the pilot. Cpl. Miller displayed fine courage, and his prompt and gallant action undoubtedly saved the pilot's life.

Cpl. R. E. ROBERTS, R.A.F.V.R.—In May, 1944, at Anzio, Cpl. Roberts was nursing orderly on an Air/Sea Rescue launch which was despatched to assist in a rescue operation at a position only three miles from the German-held coast line. The launch was attacked by enemy fighter aircraft, and Cpl. Roberts was hit by 0.5in. calibre bullets in the hand, thigh and hip. Despite his injuries he dragged a wounded gunner from his gun turret and dressed his wounds. Only when his work was finished did he mention the fact that he himself was wounded. The calmness and courage of this airman were of the highest order, and he set a fine example to others.

Cpl. K. B. BASSETT-THOMSON, R.A.F.V.R., and L.A/C. S. GOODACRE, R.A.F.V.R.—In June, 1944, these airmen were working on an airfield when a Wellington aircraft, in an attempt to make a forced landing, crashed outside the airfield and burst into flames. They immediately ran to the scene, and by the time they arrived the flames were spreading towards the pilot's cockpit. Ammunition was exploding in the central turret. The pilot was unconscious and trapped inside the aircraft. Cpl. Bassett-Thomson and a civilian assisted L.A/C. Goodacre to climb on to the wing in an effort to reach the pilot. L.A/C. Goodacre then saw a break in the perspex and, thrusting his head and shoulders through, he was able to seize the unconscious man and, twisting him round, he freed him. He then took off his parachute harness. Meanwhile, Cpl. Bassett-Thomson had smashed a hole in the side of the cockpit. L.A/C. Goodacre was able to lift the pilot out through this hole to Cpl. Bassett-Thomson and the civilian, both of whom dragged him clear. As soon as this had been done the petrol tanks exploded and the aircraft became completely enveloped in flames. The presence of mind and outstanding courage of these airmen, who acted with total disregard for their own safety, was most praiseworthy.

L.A/C. R. S. ALEXANDER, R.A.F.V.R., and A/C.1 R. W. CHAPMAN, R.A.F.V.R.—In April, 1944, a refueller, containing about 600 gallons of aviation fuel, caught fire whilst alongside a Catalina aircraft. An attempt was made to put out the fire and so save the aircraft from catching alight. The above airmen were in the party which went alongside the refueller in the marine tender to make this attempt, but it was found impossible to subdue the fire, as the refueller was red hot, and the fuel blazed again as soon as the extinguishers had been expended. An attempt to save the aircraft was then made by trying to tow the refueller away. It was fastened to a buoy, however, and a line had to be taken from the marine tender to the refueller, which, when pulled, moved the refueller about five or six feet from the aircraft. L.A/C. Alexander and A/C.1 Chapman dived through this space into the water to disconnect the cable securing the refueller to the buoy, but had to abandon their efforts, as the heat from the red hot sides of the refueller was too great. These two airmen finally made an attempt to set the aircraft adrift. They dived and managed to unshackle the Catalina from the buoy; it was then towed to safety. Both airmen showed considerable courage in dangerous circumstances. The aircraft, which might have caught fire, carried depth charges and had just been refuelled, facts of which they were aware.

SUMMER IDYLL: A recently released photograph of Tempests operating from a Continental airfield shortly after D-Day.

SERVICE

THE KING has been graciously pleased to approve the following award in recognition of gallantry displayed in flying operations against the enemy in the South-West Pacific area:—

Bar to Distinguished Flying Cross

Sqn. Ldr. A. H. BRYDON, D.F.C., R.A.A.F.

THE KING has been graciously pleased to approve the following awards:—

Military Cross

Sqn. Ldr. S. H. BELL, R.A.F.O.
Sqn. Ldr. F. J. TROLLOPE, R.A.F.V.R.
The Rev. G. C. HARDING, R.A.F.V.R.
Act. Sqn. Ldr. N. BEST, R.A.F.V.R.
Flt. Lt. R. N. RYCROFT, M.R.C.S., L.R.C.P., R.A.F.V.R.
F/O. R. A. GRAETZ, R.A.A.F.

Military Medal

Flt. Sgt. M. SCOFIELD, R.N.Z.A.F.
Flt. Sgt. R. ECKERSALL, R.A.F.V.R.
Sgt. (now F/O.) M. J. JOYCE, R.A.F.
L.A/C. J. Y. McG. S. REID, R.A.F.V.R.

Army Awards

THE KING has been graciously pleased to approve the following awards in recognition of gallant and distinguished services in Italy:—

Distinguished Flying Cross

Lt. (temp. Capt.) R. BARRASS, Royal Regiment of Artillery.

Lt. (temp. Capt.) M. B. RADCLIFFE, Royal Regiment of Artillery.

THE KING has been graciously pleased to give orders for the following appointment to the Most Excellent Order of the British Empire, in recognition of gallant conduct in carrying out hazardous work in a very brave manner:—

Lt. A. G. C. TURNER, Army Air Corps.

THE KING has been graciously pleased to approve the following awards in recognition of gallant and distinguished services in the field:—

Bar to Distinguished Service Order

Capt. (temp. Maj.) R. T. H. LONSDALE, D.S.O., M.C., Leicestershire Regiment (attd. Army Air Corps).

Distinguished Service Order

Capt. (temp. Maj.) B. A. WILSON, M.C., Army Air Corps.
Lt. J. L. WILLIAMS, Army Air Corps.

VIATION

Military Cross

Capt. (temp. Maj.) F. A. S. MURRAY, Durham Light Infantry (attd. Army Air Corps).
Capt. (temp. Maj.) A. BUSH, Army Air Corps.
Lt. (temp. Capt.) H. D. EASTWOOD, Army Air Corps.
Lt. N. H. H. ASHMORE, Army Air Corps.
Lt. The Hon. O. P. ST. AUBYN, Army Air Corps.

Distinguished Conduct Medal

W/O.2 (C.S.M.) J. STEWARD, Army Air Corps.
Sgt. (act. W/O.2 (C.S.M.)) L. E. OXLEY, Army Air Corps.
Sgt. R. F. TILLEY, Army Air Corps.

Military Medal

S/Sgt. E. J. HOLLOWAY, Army Air Corps.
Sgt. N. BINNICK, Army Air Corps.
Sgt. L. HAIG, Army Air Corps.
Sgt. A. W. ROBUS, Army Air Corps.
L/Sgt. J. S. CHANDLER, Army Air Corps.
Cpl. S. LUNT, Army Air Corps.
L/Cpl. E. HEWITT, Army Air Corps.
L/Cpl. J. ROSENBURG, Army Air Corps.
Pte. W. J. J. BARCLAY, Army Air Corps.

Foreign Decoration

THE KING has granted unrestricted permission for the wearing of the undermentioned decoration conferred upon the officer indicated in recognition of valuable services rendered in connection with the war:—

Conferred by the President of the United States of America

Air Medal and Oak Leaf Cluster

P/O. D. S. FRASER, R.C.A.F.

Roll of Honour

Casualty Communiqué No. 446.

THE Air Ministry regrets to announce the following casualties on various dates. The next of kin have been informed. Casualties "in action" are due to flying operations against the enemy; "on active service" includes ground casualties due to enemy action, non-operational flying casualties, fatal accidents and natural deaths.

Of the names in this list 81 are second entries giving later information of casualties published in earlier lists.

Royal Air Force

KILLED IN ACTION.—Sgt. R. Barnes; Sgt. F. L. Booker; Cpl. W. E. Brennen; Flt. Lt. J. G. Champion; Sgt. J. B. T. Davenport; Flt. Sgt. A. C. Drew; F/O. I. H. Forrester; Sgt. C. M. Guy; Flt. Sgt. E. F. Guy; Sgt. G. A. Herbert; Flt. Lt. P. Lines; F/O. N. Lomas; Sgt. C. H. Matthews; Flt. Lt. J. A. Morrison; Flt. Lt. E. W. Parry; Sgt. M. Singh; F/O. J. H. Steel; F/O. L. C. A. Wall; Sgt. A. W. Young.

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED IN ACTION, NOW PRESUMED KILLED IN ACTION.—Flt. Sgt. D. Diamond.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—Sgt. G. L. Abrahams; Sgt. E. Ambrose; Act. Sqn. Ldr. D. C. Anset, D.F.C.; Sgt. J. H. Aplin; Sgt. V. Arnold; Flt. Lt. E. T. Baker; Sgt. E. W. H. Bates; Flt. Sgt. J. Beebe; F/O. A. D. Bond; Sgt. H. L. Brittain; Sqn. Ldr. E. W. Brown; Act. Flt. Sgt. R. O. Buckle; Flt Sgt. A. Clark; Act. Flt. Lt. W. A. G. Clark; P/O. J. B. Cochrane; F/O. J. E. Colyer; Flt. Sgt. L. Davis; F/O. J. Dixon; Sgt. E. H. Edmonds; Sgt. W. F. Ellis; Flt. Sgt. A. G. Emery; Flt. Sgt S. W. Garbutt; Flt. Sgt. H. W. Gay; F/O. E. A. Hackshaw; Sgt. B. H. Hall; Sgt. C. Harlington; F/O. J. S. Hayden; Sgt. F. P. Heaton; P/O. A. Hine; Sgt. D. J. Hobbs; Sgt. B. H. Horscroft; Sgt. C. R. E. Hunt; Sgt. R. A. Hutchinson; Sgt. E. Jenkinson; Sgt. S. Jones; F/O. N. L. Keeble; Sqn. Ldr. R. A. Lenton, D.F.C., M.C.; W/O. J. A. C. Lovis; Sgt. A. G. Luke; Sgt. A. McDougall; Sgt. C. A. Mangion; Sgt. R. B. J. March; Sgt. W. H. Marson; Sgt. T. O'M. Mears; Sgt A. Penfold; Sgt. W. H. Perry; P/O. J. L. Richards; Flt. Sgt. J. C. Riley; Sgt. J. Robson; Sqn. Ldr. G. A. Roden; Sgt. J. L. Roll; Act. Wing Cdr. D. T. Saville, D.S.O., D.F.C.; Flt. Sgt. C. A. Simmons; Sgt. A. L. Smith; Sgt. J. Smith; Act. Flt. Lt. J. T. Smith; F/O. C. G. Stepney; P/O. G. J. H. Stokes; Sgt. E. Sullivan; Sgt. R. Tarling; F/O. G. A. Terry; Flt. Sgt. L. J. Thompson; Sgt. E. Walker; P/O. J. Walker; Sgt. K. Walshaw; Sgt. P. R. Webber; F/O. D. L. West; F/O. W. Wilson; W/O. B. C. N. Wright; Sgt. R. H. Wright.

WOUNDED OR INJURED IN ACTION.—Flt. Lt. K. S. Porter.

DIED OF WOUNDS OR INJURIES RECEIVED IN ACTION.—Flt. Sgt. T. W. Stokoe.

MISSING, BELIEVED KILLED IN ACTION.—Flt. Lt. G. E. Allison; Sgt. K. R. Mann; Flt. Lt. E. A. C. Young.

MISSING.—P/O. R. K. Adam; Flt. Sgt. G. R. C. G. Adams; Sgt. S. R. Alcock; Sgt. E. D. Anderson; Sgt. J. S. Anderson; Flt. Sgt. A. W. Ashworth; Sgt. F. G. Barrett; F/O. W. C. J. Beeson; F/O. C. Blanshard; Sgt. J. T. Boyd; Flt. Sgt. R. G. Brown; Flt. Sgt. W. A. Butcher; Sgt. K. Butler; F/O. J. A. D. Caines; Sgt. N. Carucross; Sgt. G. R. Carr; Sgt. H. B. Carter; P/O. C. A. Chandler; Sgt. E. G. Chapman; Flt. Lt. H. C. A. Chapman; Flt. Sgt. A. Chellender; Act. Flt. Lt. R. T. Clarke, D.F.M.; F/O. H. Coker; F/O. P. L. Collins; Sgt. G. L. Copeland; Flt. Sgt. B. J. Corkery; Flt. Sgt. E. Cornish; Flt. Sgt. J. E. K. Courthorpe; Sgt. R. F. Cousin; W/O. C. T. Crawley; Sgt. E. L. Cull; Act. Sqn. Ldr. G. G. Davies, D.S.O.; P/O. J. Dean; F/O. F. C. G. Debrock, D.F.C.; W/O. L. A. Ding; Sgt. K. S. Eddie; Sgt. L. Fairclough; Sgt. D. Finlayson; W/O. L. Fynn; Sgt. H. Gordige; Sgt. R. A. Gale; Sgt. J. Grice; F/O. R. B. Hall; Sgt. L. Henderson; Sgt. J. M. Hewlett; Sgt. H. D. Hoare; F/O. F. Holbrook; Sgt. B. F. Holland; Flt. Lt. W. F. M. Holman; Flt. Sgt. A. A. Holt; F/O. W. J. Hough; P/O. E. T. Hughes; W/O. J. W. Hutton; Flt. Sgt. J. Ingham; Flt. Sgt. E. W. Jenner; Flt. Sgt. J. A. Johnson; Sgt. J. Kerfoot; F/O. D. B. Lambton; F/O. F. J. Lockwood; Flt. Lt. E. A. Loos, D.F.C.; F/O. D. Luker; Sgt. J. McMillan; Sgt. R. Millar; Sgt. L. A. Miller; Act. Flt. Lt. J. Morgan; Sgt. A. A. G. Morrison; Sgt. W. E. Moseley; Flt. Sgt. H. H. Moulden; Sgt. H. W. Nichols; P/O. D. W. Noyes; Sgt. A. Osborn; Sgt. J. E. Palmer; Flt. Sgt. T. E. Passage; Flt. Sgt. W. D. Phillips; Sgt. S. A. Picton; Sgt. A. Pinder; Sgt. L. A. Pointer; Sgt. R. J. Poulton; P/O. L. Priestley; Sgt. J. Purves; Flt. Sgt. J. E. Richardson; F/O. L. G. Rolton, D.F.C.; Sgt. G. E. Ross; Flt. Sgt. G. T. Ryan; Sgt. D. Scott; Flt. Sgt. H. T. Shaylor; Sgt. C. P. Shotton; Sgt. F. J. Smith; Act. Flt. Lt. J. B. P. Spencer; Sgt. H. R. Spendelow; Flt. Sgt. A. B. Steele; Flt. Sgt. G. E. Stenner; Act. Flt. Lt. K. Stevens; Flt. Sgt. D. G. W. Stewart; Sgt. J. A. Stone; Act. Flt. Lt. L. H. Such; Sgt. J. M. Sumner; P/O. R. T. Walsham; Flt. Sgt. G. C. Wells; Sgt. W. G. E. West; Flt. Sgt. T. W. Whitehand; W/O. L. T. Woodward; Act. F/O. C. E. M. Worner; Sgt. K. Yearsley.

KILLED ON ACTIVE SERVICE.—F/O. R. F. Ball; Sgt. J. E. Brewer; Sgt. C. S. W. Byerley; P/O. G. E. Collins; Flt. Sgt. A. C. Cox; W/O. T. Davies; P/O. F. L. Dumbleton; Sgt. B. F. Hadfield; Flt. Lt. R. W. Hardcastle; Sgt. H. Jones; Sgt. R. W. Knight; Sgt. G. F. P. McCarthy; Sgt. D. Marks; Sgt. E. R. Matthews; Sgt. R. J. Neeson; Sgt. H. K. Pilling; L.A/C. W. Pither; Flt. Sgt. G. Preston; Flt. Sgt. L. J. Reason; Sgt. D. J. Roberts; Flt. Lt. G. F. Roberts; F/O. F. G. Saunders; Sgt. N. I. Skidmore; F/O. E. J. Smith; Flt. Sgt. P. H. Walden; Sgt. G. F. W. Walker; Sgt. J. G. Walshe; L.A/C. R. J. Walter; F/O. C. W. Warren; Flt. Sgt. A. F. W. Wood.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED ON ACTIVE SERVICE.—Flt. Lt. H. G. J. Coddington.

WOUNDED OR INJURED ON ACTIVE SERVICE.—Sgt. W. F. Baty; Group Capt. F. Carpenter; W/O. T. J. Decourcy; Flt. Sgt. R. H. Gale; Sgt. C. S. A. Johnston; L.A/C. G. Mitchell; F/O. J. Osborne; Sgt. R. D. Tait; W/O. A. L. Walduck.

DIED OF WOUNDS OR INJURIES RECEIVED ON ACTIVE SERVICE.—F/O. R. Middlemas.

DIED ON ACTIVE SERVICE.—L.A/C. C. L. Allen; Cpl. G. E. C. Barnes; Sgt. J. Berry; A/C.2 J. J. Bunting; Cpl. P. Collinge; L.A/C. J. T. Coulter; Sgt. R. C. Cullip; Sgt. F. J. K. Fox; Cpl. R. Gandy; A/C.1 B. R. J. Hardy; Flt. Sgt. F. A. Middleton; Sgt. H. C. Nightingale; Flt. Lt. G. W. Palmer; L.A/C. W. H. Peirce; Act. Cpl. P. Richardson; Sgt. L. D. Shortland; L.A/C. J. Sorby; L.A/C. J. L. Taylor.

PREVIOUSLY REPORTED PRISONER OF WAR, NOW REPORTED DIED ON ACTIVE SERVICE.—A/C.2 W. H. Lumsden.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER OF WAR.—Flt. Lt. N. Butler, D.F.C.; Flt. Sgt. H. Owen; Flt. Sgt. K. A. Shannon; Flt. Sgt. K. Singleton.

ASSAULT SHIP: *Commando*, **R.A.F. Transport Command's famous Liberator, which inaugurated the Command's Pacific route.**

Women's Auxiliary Air Force

DIED ON ACTIVE SERVICE.—L.A/CW. I. Litchfield; L.A/CW. M. Sayer; A/CW.2 A. H. Stabb; A/CW.1 H. Green.

Royal Australian Air Force

KILLED IN ACTION.—Flt. Sgt. M. W. Nielsen; W/O. A. R. Rix.

WOUNDED OR INJURED IN ACTION.—Flt. Sgt. E. G. Oldham; Flt. Sgt. D. J. Pegg.

MISSING.—Act. Flt. Lt. E. W. Chitty; W/O. H. S. Jordan; P/O. S. Keen; W/O. K. E. Kerridge; Act. Flt. Lt. H. G. M. Robinson, D.F.C.

KILLED ON ACTIVE SERVICE.—Sgt. R. F. Coffey; F/O. E. K. Hender; F/O. A. M. Tindale.

DIED OF WOUNDS OR INJURIES RECEIVED ON ACTIVE SERVICE.—F/O. F. J. Englefield.

Royal Canadian Air Force

KILLED IN ACTION.—F/O. H. A. T. Clark; F/O. H. Reid.

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED IN ACTION, NOW PRESUMED KILLED IN ACTION.—Flt. Sgt. H. V. Tracey.

MISSING, BELIEVED KILLED IN ACTION.—F/O. N. T. Andrews; P/O. J. D. Clark; W/O. W. C. Powers.

MISSING.—Flt. Sgt. P. Andersen; F/O. J. G. Ayon; F/O. R. J. Bennett; Sgt. J. L. A. Blais; F/O. W. S. Bonell; Flt. Lt. G. Croucher; F/O. J. T. Daly; P/O. A. H. Durnin; Sgt. D. F. Enright; Flt. Lt. A. F. Fowke; Flt. Sgt. H. B. Gilmore; F/O. J. E. Gloeckler; F/O. D. E. Hillman; W/O. N. Holyk; Flt. Sgt. J. A. K. Imrie; P/O. J. R. Irish; Sgt. E. C. King; Flt. Lt. H. M. La Flamme; Flt. Sgt. G. L. Lindensmith; F/O. J. W. Lippert; Flt. Sgt. R. F. McKinney; F/O. G. R. Murphy; W/O. T. J. Peacore; F/O. J. O. Peltier; F/O. D. D. Platana; Flt. Sgt. J. R. Robertson; F/O. D. T. Ryan; P/O. J. A. Santo; F/O. D. J. Shapter; Flt. Sgt. J. H. Singer; P/O. H. E. Truscott; P/O. R. D. Whitson; P/O. W. J. L. Wright.

KILLED ON ACTIVE SERVICE.—Flt. Sgt. J. E. Code; P/O. P. P. Davies; F/O. J. T. Evans; Sgt. R. L. Movold; W/O. J. M. Murie; Sgt. G. W. Pidgeon; Flt. Sgt. J. J. Pigeon; P/O. E. F. Pitkin; Flt. Sgt. L. Snider; Flt. Lt. G. D. Stark; Flt. Sgt. B. E. Tees; F/O. W. M. Wallace; Sgt. M. H. Waters.

PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED ON ACTIVE SERVICE.—P/O. H. R. D. Patton.

WOUNDED OR INJURED ON ACTIVE SERVICE.—Sgt. P. J. W. Burns.

Royal New Zealand Air Force

KILLED IN ACTION.—P/O. J. E. McK. Hulme; P/O. L. P. Jarratt; Flt. Sgt. H. R. Riddle.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—Flt. Sgt. M. C. Baynes; F/O. N. L. Burton.

MISSING.—F/O. I. A. Blaikie; Act. Flt. Lt. G. R. Jodin; W/O. H. A. Johansson; Flt. Sgt. F. M. Larnach; P/O. K. F. Morgan; Flt. Sgt. J. D. Syverston; P/O. J. R. Tones; W/O. W. R. Tuck.

South African Air Force

KILLED IN ACTION.—Lt. A. Dickinson.

MISSING.—Lt. P. Kleyn; Lt. H. C. Stanton; Lt. H. Thistleton.

SERVICE AVIATION

Casualty Communiqué No. 447

Of the names in this list, 75 are second entries giving later information of casualties published in earlier lists.

Royal Air Force

KILLED IN ACTION.—Flt. Sgt. R. G. Amory; Sgt. L. R. Barber; Sgt. T. S. Barnett; Sgt. E. S. Clarke; Sgt. R. G. Crabb; Flt. Sgt. F. Crowther; P/O. W. Davidson; Act. Flt. Lt. M. C. Day; Flt. Sgt. W. J. Edwards; Flt. Sgt. L. Fisher; Flt. Sgt. D. Guest; Flt. Lt. A. B. Hill; Flt. Lt. P. Lebrocq; Sgt. L. Matthewman; Flt. Sgt. J. M. Maxwell; P/O. D. G. Mills; Flt. Sgt. D. H. Noise; Sgt. J. S. F. Morrish; Sgt. K. Nicholson; W/O. A. L. Page; Sgt. D. A. R. Parham; Flt. Sgt. A. C. Pugh; Sgt. E. Roxby; Sgt. J. Smith; Sgt. H. J. Watkins.

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED IN ACTION, NOW PRESUMED KILLED IN ACTION.—Sgt. J. F. Gordon; Flt. Sgt. H. K. Levy; Flt. Sgt. J. S. McKay; F/O. W. T. Potter; F/O. L. Rossner; F/O. J. Walton; Sqn. Ldr. H. A. A. Webster.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—Sgt. W. Aitkenhead; Sgt. G. P. Baylis; Sgt. S. Beedle; Flt. Sgt. H. Brennand; Flt. Sgt. R. Charlton; P/O. W. Clarkson; Flt. Sgt. K. R. Copas; Sgt. D. C. S. Davie; F/O. J. J. Dawkins; Sgt. J. Dixon; Sgt. H. Dobson; Flt. Sgt. A. V. Forsyth; Sgt. L. C. Gaskins; Sgt. E. C. Goodwin; Sgt. J. H. Harper; Sgt. F. Hemingway; Act. Flt. Lt. W. T. Irwin; Sgt. S. Irving; P/O. R. J. Jones; Sgt. W. Jones; Sgt. C. E. R. Lane; Sgt. F. Lawrenson; Sgt. H. Macaulay; Flt. Sgt. J. H. Mallin; F/O. D. V. Mansell; P/O. J. C. Otter, D.F.C.; Sgt. T. R. Oxley; Sgt. J. Parsons; Sgt. P. H. Potter; Sgt. C. J. Poulton; Sgt. A. Richmond; Act. Flt. Lt. R. Roberts, D.F.C.; P/O. A. J. Scott; Sgt. N. J. Shakespeare; Sgt. W. Shaw; P/O. D. M. C. Silverman, D.F.M.; W/O. F. J. Spencer; P/O. M. J. E. Stoneley, D.F.M.; Sgt. R. Stratton; Flt. Sgt. G. B. Taylor; Act. Flt. Lt. E. M. Thompson, D.F.C.; Sgt. J. A. Thompson; Flt.Sgt. J. C. Wade-Seymour; F/O. R. T. Watkinson; P/O. W. J. Watson; F/O. D. C. Welch; F/O. H. White; Act. Wing Cdr. J. H. White, D.F.C.; P/O. W. Wilkinson, D.F.C.; Sgt. H. L. Wood; Sgt. R. V. Woods; W/O. S. Woolhouse.

PREVIOUSLY REPORTED MISSING, BELIEVED KILLED IN ACTION, NOW REPORTED KILLED IN ACTION.—F/O. A. J. Milton.

PREVIOUSLY REPORTED MISSING, NOW REPORTED KILLED IN ACTION.—Sgt. J. P. Downs; Flt. Sgt. T. A. Hamilton.

WOUNDED OR INJURED IN ACTION.—Sgt. G. W. Hatton; F/O. J. R. Morrison; Flt. Sgt. E. F. Pennie; Flt. Sgt. F. G. Woollard.

MISSING, BELIEVED KILLED IN ACTION.—P/O. J. Dodd; F/O. R. Glen; P/O. H. W. H. Kerbey; Capt. P. J. S. Louw; Sgt. V. McKenzie; Act. Sqn. Ldr. H. Paynter; Flt. Sgt. T. F. Riley; Flt. Lt. J. Stevens F/O. P. E. Tomkins.

MISSING.—Sgt. R. P. Arthur; Flt. Sgt. R. Ayton; F/O. D. J. Bambury; F/O. R. A. Banks; Sgt. R. J. M. Batty; F/O. J. M. Beaton; Flt. Sgt. L. Bedborough; Sgt. C. Birds; Act. F/O. A. H. G. Bond; Sgt. I. Bowley; P/O. R. D. Bridgman; Sgt. D. C. Broome; Sgt. G. W. Bumstead; Flt. Sgt. D. R. Butler; Flt. Sgt. F. A. J. Button; Sgt. W. J. C. Cambridge; Flt. Sgt. J. Casebrook; F/O. J. Christie; F/O. A. Clarkson; F/O. J. T. Clifford; Sgt. J. H. Codd; F/O. A. S. Cole; Flt. Sgt. S. J. Compton; Flt. Sgt. H. W. Cook; Sgt. W. R. Cotgrove; F/O. J. L. Coward; Sgt. R. F. Crowe; Sgt. F. E. Dalby; Sgt. G. W. Dalton; W/O. W. J. Davies; Sgt. M. Duncan; Sgt. W. J. Dunn; Sgt. R. E. Digby; Sgt. T. Donelan; Sgt. F. Eden; F/O. D. K. Flaherty; Flt. Sgt. F. Fowler; F/O. G. E. Franklin; F/O. E. H. H. Galloway; F/O. J. A. Garrett; Sgt. J. M. Gittoes; Sgt. W. D. Glenn; P/O. V. T. Glossop; Flt. Sgt. R. Gollop; Sgt. R. Gresswell; Flt. Sgt. T. R. Gunn; Sgt. J. P. Guy; Flt. Sgt. F. H. Hall; Flt. Lt. J. W. Harder; P/O. R. B. V. Harris; F/O. E. H. Harrison; Act. F/O. T. G. Harrison; W/O. W. Herbert, D.F.M.; Act. Flt. Lt. A. T. Hope-Robertson; Sgt. R. Hood; F/O. F. Hosier; Flt. Sgt. H. Hoyle; Sgt. E. H. Hunter; F/O. K. Jenkinson; Sgt. K. Jenvey; F/O. F. C. H. Johns; Sgt. G. Johnson; Sgt. R. M. W. Johnson; P/O. D. F. Jones; Flt. Sgt. G. H. Jones; Sgt. L. B. Kelsey; Sgt. G. E. Kirkpatrick; Sgt. C. R. Knapman; Sgt. F. N. Knapp; Sgt. R. Knapton; Sgt. H. K. L'Estrange; Sgt. L. E. Lilley; Sgt. A. Lowrey; Sgt. G. C. J. Ludlow; Sgt. J. A. J. M. McGhie; Flt. Sgt. G. R. S. Miller; Sgt. T. Moore; Flt. Sgt. N. P. Morris; Act. Flt. Lt. S. G. Norris; Sgt. J. H. Morrison; Sgt. J. Newlands; F/O. K. C. Parsons; Act. W/O. J. Patterson; Sgt. A. R. Pattillo; Sgt. E. Pattison; Sgt. L. P. Peace; Flt. Sgt. R. C. Pink; Flt. Sgt. K. W. Pope; F/O. O. W. Porter; Flt. Lt. W. L. Powell; Flt. Lt. P. Quine; Act. Flt. Lt. T. G. L. Reynolds; Flt. Sgt. S. D. G. Rice; F/O. F. B. Robertson; Sgt. R. Rodger; Flt. Sgt. J. J. Rogers; Sgt. W. P. Rudland; Sgt. P. A. Scratchley; F/O. M. R. Shute; Flt. Lt. A. J. Smitz, D.F.C.; Flt. Lt. H. A. F. Smith; P/O. J. Smith; Sgt. D. C. Stephens; F/O. G. Tipping; Sgt. F. Tough; Sgt. V. F. T. Trumper; Sgt. P. O. F. Wadsworth; Flt. Lt. W. C. Walton, D.F.C.; P/O. A. G. Waples; Sgt. F. Ward; Act. Flt. Lt. M. Ward; Act. F/O. A. V. H. Wardle; Sgt. J. F. West; Flt. Sgt. G. W. Wheeler; Flt. Sgt. J. Wheeler; P/O. C. G. W. Whitehead; Sgt. G. W. Whiting; Sgt. F. H. Whittington; F/O. G. L. Williams, P/O. M. N. Williams; Flt. Sgt. W. A. Williams; Sgt. S. E. Wiltshire.

KILLED ON ACTIVE SERVICE.—Sgt. K. J. Abraham; Flt. Lt. H. W. Adams; Sgt. E. Anderson; Flt. Lt. A. J. Baker; Sgt. B. E. W. Becker; Flt. Lt. J. G. Biddell; Sgt. F. Bowers; A/C.2 A. G. Clark; Sgt. G. T. H. W. Cocksedge; Sgt. R. G. H. Feasey; Sgt. A. Gater; L.A/C. S. Gilmour; Sgt. E. H. Gresswell; F/O. L. G. Greenwood; L.A/C. R. K. Hall; Sgt. J. A. Hiscock; Sgt. E. Hodgson; Group Capt. J. W. Homer; Flt. Sgt. J. G. L. Hughes; F/O. D. W. King; L.A/C. P. H. Langstaff; Flt. Lt. B. Lees; Sgt. M. R. Lim; Flt. Lt. R. W. Lloyd; Flt. Sgt. K. J. Luscombe; Flt. Lt. F. Meakin; W/O. I. A. Morgan; F/O. H. Morrison; Flt. Lt. R. F. Murray; P/O. W. Ness; L.A/C. E. H. Nicholls; Flt. Lt. J. G. Oliver; Sgt. G. A. Payne; Flt. Lt. I. M. Rankin; F/O. J. F. Rose; F/O. A. H. Squires; Sgt. S. Thompson; Sgt. S. B. Tuff; Act. Flt. Lt. W. G. Wainwright-Farey; Flt. Sgt. D. J. Whiffen; Act. Wing Cdr. E. A. Wollaston.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED ON ACTIVE SERVICE.—Sgt. P. P. Bacon; Sgt. C. Barraclough; F/O. K. Hipwell; Sgt. J. Male; Sgt. C. E. Poots; Sgt. H. E. Scarman.

WOUNDED OR INJURED ON ACTIVE SERVICE.—Sgt. F. Barber; Flt. Lt. J. C. Fletcher; Flt. Lt. G. E. Jackson; Sgt. K. J. Miller; L.A/C. T. Ord; P/O. J. S. Roebuck; L.A/C. R. Sawyer.

DIED OF WOUNDS OR INJURIES RECEIVED ON ACTIVE SERVICE.—Sgt. S. T. Collis; A/C.1 H. Statham; P/O. P. M. Sutherland.

DIED ON ACTIVE SERVICE.—L.A/C. I. N. A. Beales; A/C.1 H. R. Beskeen; Wing Cdr. C. H. Brandon; Cpl. E. Clare; Cpl. N. De Saulles; Cpl. C. B. Landreth; L.A/C. G. L. Marshall; A/C.2 P. C. Marshall; A/C.1 A. Reed; A/C.1 A. Renwick; L.A/C. A. Robb; Cpl. H. N. J. Sales; L.A/C. J. R. Surtees; L.A/C. W. Thomas; Cpl. F. Thompson; L.A/C. H. Verrall.

Women's Auxiliary Air Force

DIED ON ACTIVE SERVICE.—A/CW.2 V. Payne.

Royal Australian Air Force

KILLED IN ACTION.—P/O. R. A. McGregor.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—Flt. Sgt. C. H. Edwards; Flt. Sgt. M. H. Hardy; Flt. Sgt. J. I. McKee.

WOUNDED OR INJURED IN ACTION.—Flt. Lt. R. H. Cox.

MISSING.—Act. Flt. Lt. R. C. Banfield; Flt. Sgt. E. B. Brown; Flt. Sgt. E. Burke; P/O. R. L. Carr; Flt. Sgt. E. J. Fallon, F/O. I. Fotheringham; Act. F/O. D. C. Gundry; Flt. Sgt. L. C. Leak; Act. F/O. L. L. Pemberton; F/O. C. A. Phillips; P/O. F. J. Pottinger; Flt. Sgt. V. J. Scheldt; Act. F/O. M. T. Thomas.

KILLED ON ACTIVE SERVICE.—Flt. Sgt. K. J. Banfield; Flt. Sgt. R. J. Crotty; Sgt. B. D. Northmore; Flt. Sgt. K. A. M. Palmer; W/O. P. Smith.

DIED ON ACTIVE SERVICE.—Flt. Sgt. B. T. Sloane.

Royal Canadian Air Force

MISSING, BELIEVED KILLED IN ACTION.—Flt. Sgt. A. M. Leonard.

MISSING, BELIEVED KILLED ON ACTIVE SERVICE.—P/O. A. J. Goldman.

DIED ON ACTIVE SERVICE.—L.A/C. A. Smith.

Royal New Zealand Air Force

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION.—Flt. Sgt. S. G. Cottrell; Flt. Sgt. A. L. Lewis.

MISSING, BELIEVED KILLED IN ACTION.—Flt. Sgt. T. K. Durie; Flt. Sgt. A. C. Fletcher.

MISSING.—Flt. Sgt. E. G. Houghton; F/O. R. K. Jones; Flt. Sgt. W. S. McIlraith; P/O. K. McL. MacKay; F/O. L. W. McLean; P/O. P. M. Price; Flt. Sgt. E. J. Quinn; Sqn. Ldr. P. W. Rabone, D.F.C.; Flt. Sgt. A. A. Simpson; Flt. Sgt. G. A. Sinclair; Flt. Sgt. A. T. Stone; P/O. H. Whittington; P/O. R. Wood; Flt. Sgt. J. Worth.

PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED ON ACTIVE SERVICE.—Flt. Sgt. R. J. Wright, D.F.M.

DIED ON ACTIVE SERVICE.—W/O. D. A. Harkness.

PREVIOUSLY REPORTED MISSING, NOW REPORTED PRISONER OF WAR.—Flt. Lt. M. R. Breed.

CEYLONESE MUFFS: Cameras of a photographic reconnaissance unit in Ceylon being unloaded from a truck. The electrically heated muffs are designed to keep the cameras warm at great heights.

South African Air Force

KILLED IN ACTION.—Capt. P. C. R. Burger.

MISSING.—2/Lt. G. R. Connell; Lt. N. Cooney; Flt. Sgt. D. Emslie; Lt. D. M. A. Hunter; Lt. K. A. Patton; Lt. T. R. Van Graan; Lt. F. A. Van Rensburg.

WOUNDED OR INJURED ON ACTIVE SERVICE.—Maj. S. V. B. Theron, D.S.O.

Air Transport Auxiliary

THIRD OFFICER JAMES MILSON, A.T.A., killed whilst ferrying His Majesty's aircraft in Scotland.

Official Corrections

Casualty Communiqué No. 443.

Under "MISSING," for Sgt. P. H. Bowen read Flt. Sgt. P. H. Bowen. Delete Flt. Sgt. M. E. Marriott, Sgt. J. A. Mitchell, F/O. K. A. J. Trott.

R.C.A.F.—Under "PREVIOUSLY REPORTED MISSING, NOW PRESUMED KILLED IN ACTION," for F/O. J. Craig read Flt. Lt. J. Craig.

Under "MISSING," for W/O. J. D. Bishop read P/O. J. D. Bishop. Delete Sgt. L. J. Glenny. For W/O. F. R. Hopkins read P/O. F. R. Hopkins.

Under "KILLED ON ACTIVE SERVICE," for Sgt. W. S. Barnard read Flt. Sgt. W. S. Barnard.

S.A.A.F.—Under "MISSING," delete Lt. H. G. Chapman and Capt. R. T. Hutchinson.

Casualty Communiqué, No. 444.

Under "MISSING" delete Flt. Sgt. J. W. Aldridge, Sgt. R. H. Brewer, Act. Sqn. Ldr. V. G. F. Coleman, Sgt. A. M. B. Cutting, Sgt. W. I. Dransfield, Air Comdre. I. J. Fitch, Flt. Sgt. A. A. Holmwood, Sgt. H. C. Kneil, F/O. A. E. Lawless, Sgt. M. E. T. Macrae, Sgt. G. F. Robinson, Flt. Sgt. C. Shaw, F/O. P. Vogt, Sgt. F. R. W. Waters. Delete Sgt. C. S. Smith and transfer to "KILLED IN ACTION."

R.A.A.F.—Under "MISSING" delete Flt. Sgt. M. J. Nolan.

R.C.A.F.—Under "MISSING" for W/O. F. W. Hood read P/O. F. W. Hood. For W/O. J. W. Weyers read P/O. J. W. Weyers.

S.A.A.F.—Under "MISSING" delete Maj. D. H. Barlow.